SPOTTY SUPPORT Users and resellers urge Microsoft to bolster its service and support for multiuser Windows NT nets. Page 12.

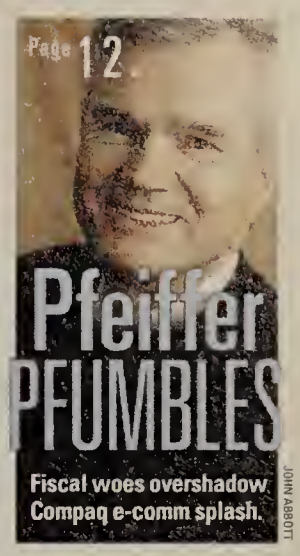
AREA CODE MESS Are area codes multiplying out of control due to telco mismanagement? Page 6

The newsweekly of enterprise network computing

NetworkWorld

April 19, 1999 Volume 16, Number 16

The network portal: www.nwfusion.com



POLICING POLLUTION

The Environmental Protection Agency combs through networks to get the goods on environmental criminals.

BY DEBORAH RADCLIFF

As wind and rain pummel the water, a valve opens, sending oil through a line that is normally attached to a tanker. But there is no tanker present, so the oil belches into the water. The oil company at fault blames the weather. The Environmental Protection Agency investigates and concludes that the incident is an environmental crime.

"Our analysis showed that somebody was operating the computer [which controls the oil delivery process] and deliberately manipulated the system to open the valve, which caused the oil spill," says Earl Devaney, director of the EPA's Office of Criminal Enforcement, Forensics and Training (OCEFT) in Washington, D.C.

Because it's an open case, Devaney can't discuss details. But he does say that by following a trail of activity through the oil company's network, agents proved that a disgruntled employee — not the storm — caused the $3 million spill.

See **Policing pollution,** page 55

OANUTA OFTINOWSKI

Key DSL flavor faces big compatibility test

But G.Lite modem makers hope to achieve interoperability by June.

BY TIM GREENE

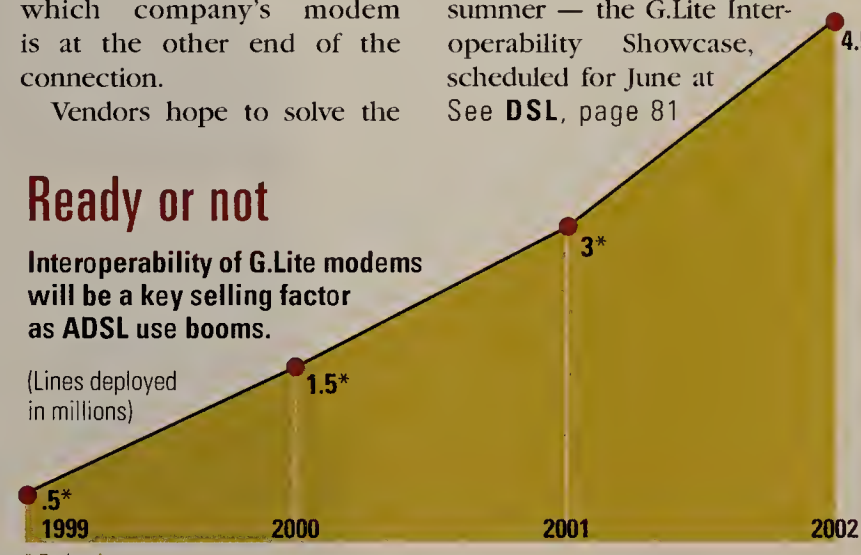
Everyone knows that the umpteen flavors of digital subscriber line technology have trouble talking to each other. But did you know that G.Lite — considered the DSL flavor most likely to succeed — still can't talk to itself?

G.Lite modems will have compatibility problems until a standard is firmly set. Then, equipment vendors can focus on interoperability.

Modem makers are feverishly trying to correct compatibility problems so customers can buy any G.Lite modem and sign up for any G.Lite service without worrying about which company's modem is at the other end of the connection.

Vendors hope to solve the bulk of the problems in time for a crucial compatibility test this summer — the G.Lite Interoperability Showcase, scheduled for June at

See **DSL**, page 81



Start-ups aim to change how hardware is built

BY ROBIN SCHREIER HOHMAN

AUSTIN, TEXAS — A couple of start-ups are developing new microprocessors that could revolutionize the way network vendors design, manufacture, sell and upgrade their equipment.

Newcomers Agere and C-Port and some of the more established chip vendors, such as MMC, are working on new network-only processors for

See **Start-ups**, page 81

HP lays out OpenView unification plan

BY JEFF CARUSO

BOSTON — Network, systems and application management are about to get cozier at Hewlett-Packard, which last week said it is binding diverse products together with a common user interface and standard data sharing technology.

The plan emerged during the HP OpenView Forum &

See **OpenView**, page 87

netfinity servers.permanent hardware

intel inside

pentium® III xeon™

*Estimated reseller price to end users for Netfinity 5500 M20 model 866231Y includes IBM 4.5gb Hard Disk Drive. Certain features described are available for an additional charge. Actual reseller prices may vary. mhz denotes microprocessor internal clock speed, other factors may also affect application performance. IBM product names are trademarks of International Business Machines Corporation. Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation. Intel, the Intel Inside logo and Pentium are registered trademarks and Pentium III Xeon is a trademark of Intel Corporation.

Netfinity 5500
servers for Windows NT

price	from $8,525*
power	up to 4-way Intel® Pentium® III Xeon™ processors 500 mhz, up to 4gb ecc memory
reliability	hot-plug and hot-add PCI component redundancy lightpath diagnostics option: fibre channel storage
notes	Introducing the new Netfinity 5500 M20. Affordable, high-reliability servers for Windows NT.® This is heavy-duty hardware designed for growth and built on enterprise-class availability technologies you won't find in any other server for Windows NT. For full technical specs and implementation information, go to www.ibm.com/netfinity or call 800 426 7255, ext. 4176.

e-business tools

IBM®

Now you can pick up

www.nortelnetworks.com/16DY

all your messages

at one convenient location.

Introducing CallPilot - the latest in unified messaging technology from Nortel Networks™. CallPilot lets you manage e-mail, voice mail and fax messages with the mere click of your mouse, all from within your familiar e-mail interface.* You can even use our revolutionary speech recognition feature to manage your messages using simple voice commands. All this is made possible with a Unified Network from Nortel Networks, which enables you to integrate voice, video and data and create a communications solution that will serve your needs well into the future. For more information, **call 1-800-4 NORTEL**, or visit us at **www.nortelnetworks.com/16DY**

NORTEL NETWORKS™

How the world shares ideas.

NetworkWorld Fusion
www.nwfusion.com

NetworkWorld

APRIL 19, 1999

THIS WEEK ONLINE

Ex-military in IT. Our article on hiring from the military prompted a number of comments from ex-military IT professionals about how life in uniform prepares one for networking. But we also heard from a civilian who says he and other administrators had to stage an IT coup to undo damage done by an overly rigid ex-colonel. Read the dueling comments and take your best shot. **DocFinder: 2542**

VPNs. Want to use the Internet as a WAN or extranet? You'll need virtual private network (VPN) technology. If you've just begun thinking about VPNs, listen to the panel of grizzled VPN veterans we recently assembled tell us how they rolled out the technology. Or if you don't want to listen, read the transcript of our roundtable. **DocFinder: 2544**

Remote access. Speaking of VPNs, Ron Nutter this week looks at them as an alternative to traditional dial-up remote access — and addresses their pros and cons. **DocFinder: 2545**

How to advance NDS? Fusion users recently debated whether Novell should give away Novell Directory Services for NT as a way of fending off Microsoft's impending Active Directory. Now one user has a more radical idea: Turn NDS into open source software: "I'd like to see a Mozilla-like organization with the NDS source code. I'd like to see NDS for BeOS, OS/390, AS/400, Solaris, Linux, SCO, MacOS, etc., etc." What do you think? **DocFinder: 2543**

XML. Looking to begin playing with Extensible Markup Language (XML)? Check out our XML Downloads area, where you'll find numerous free and evaluation tools, from editors and validators to browsers. **DocFinder: 2546**

How to get onto Network World Fusion

Click on Register on the home page and follow the instructions. Subscribers, keep your NWF number — highlighted on the front cover's mailing label — handy during registration. Nonsubscribers must fill out an online registration form.

Table of Contents

ICG's Kael Loftus is getting tough on job candidates by using new skills assessment tests. Page 65.

Special Focus

PACKET TELEPHONY

Cisco's voice plans lead to the telephony throne. Page 36.

HOW TO CONTACT US

WRITE: Network World, 161 Worcester Road, Framingham, MA 01701; CALL: (508) 875-6400;
FAX: (508) 820-3467; E-MAIL: nwnews@nww.com;
CIRCULATION: CALL: (508) 820-7444;
FAX: (508) 270-8869; E-MAIL: nwcirc@nww com;
STAFF: See the masthead on page 16 for more contact information. **REPRINTS:** (717) 560-2001

FEATURES

Policing pollution:

Earl Devaney (right) and the EPA comb through nets to get the goods on environmental criminals. Page 1.

MINDING YOUR QoS P'S AND Q'S: A pair of IEEE standards enables you to prioritize services across switched nets, but first you'll want to consider queuing and testing issues. **Page 51.**

REVIEW: Check Point Software's Firewall-1 tops five competitors in our test of a new class of device that combines firewall and VPN functions to simplify security. **Page 57.**

COOL TOOLS: Caere's OmniPage Web helps you bring paper documents to the Web. **Page 63.**

NEWS BRIEFS, APRIL 19, 1999

Cisco losing entrepreneur

Bill Carrico is leaving as the head of Cisco's $2 billion small and mid-size business unit, less than a year after he joined the network giant.

Carrico, recognized as one of Silicon Valley's most prolific entrepreneurs, will be succeeded by Charlie Giancarlo, head of Cisco's global alliances business. Carrico is married to Judy Estrin, Cisco's chief technology officer.

Together, Carrico and Estrin founded Precept Software and joined Cisco when the company bought Precept last year. Precept was the third start-up Estrin and Carrico co-founded.

Lucent and Compaq get the message

Lucent last week got some help in its effort to sell unified messaging systems to users. The company signed a technical and marketing alliance with Compaq under which the computer maker's channels will sell Lucent's Octel Unified Messenger.

The product encodes voice and fax messages into Microsoft Exchange mailboxes, provides a unified graphical interface for all three message types on client PCs, and uses text-to-speech conversion to let users hear their e-mail over remote telephones.

The two companies will initially offer a packaged version of Octel Unified Messenger on a Compaq ProLiant server for $200 or less per user.

Symantec taps IBM exec

Symantec has hired IBM executive John Thompson to be its new president, chairman and CEO. Thompson, 49, has been general manager of IBM Americas, a $37 billion business.

He spent nearly 30 years at IBM, much of it in customer relations, management and high-level marketing. Carl Carman, Symantec's current chairman, will remain on the board.

FBI makes arrest in Internet stock hoax

The FBI last week arrested a PairGain Technologies employee on federal charges of securities fraud for allegedly disseminating false information about PairGain on the Web (*NW*, April 12, page 6). The FBI arrested Gary Hoke, 25, in Raleigh, N.C. After arraignment, Hoke was set free on $50,000 bond. Securities fraud is punishable by up to 10 years in federal prison and a $1 million fine. Hoke's hoax caused PairGain's stock to soar 30% after he allegedly posted a bogus news story on the Internet claiming the company was to be acquired by rival ECI Telecom for more than $1 billion.

The government alleges that Hoke used a free Web page service operated by Angelfire.com and a free e-mail service operated by Hotmail.com to create the scam. The government does not specifically allege that Hoke traded PairGain stock on April 7, but an affidavit said Hoke has a history of using online trading companies to purchase and sell securities.

Microsoft Institute of Technology?

An odd twist of fate may make a dream come true for Bill Gates: seeing the development of future Web standards take place in a house of his own making. Gates last week donated $20 million to the Massachusetts Institute of Technology to fund construction of a building for MIT's Laboratory for Computer Science (LCS).

Thing is, Tim Berners-Lee's MIT-based World Wide Web Consortium (W3C) already shares digs with LCS and will probably end up in the new William H. Gates building. "Oh my," said one W3C staff member. "We can simply refer to the building by number, can't we?" MIT traditionally refers to its buildings by their numbers.

Gates not spooked by Linux

Microsoft Chairman Bill Gates, at a trade show last week, predicted Linux would see only a limited role in enterprise network computing. Gates said Microsoft has taken Linux seriously, but he feels that most customers will continue to favor Windows because it is a more homogeneous product than Linux. He said Linux development is in the hands of a diffuse band of programmers.

As an example, Gates noted that there are five different windowing systems that run on Linux. Linux is a free operating system that some industry experts say will ultimately threaten Microsoft's dominant Windows operating system. IBM, Dell and other big vendors have recently hopped on the Linux bandwagon.

FCC looks to avert new phone number 'crisis'

BY DAVID ROHDE

LOS ANGELES — The country is in danger of running out of phone numbers again. And this time the telephone companies' old excuse — the growth of cellular phones, pagers and fax machines — won't cut it.

Alarmed at the rapid multiplication of new area codes, the Federal Communications Commission this spring will issue a proposal to force local carriers to start changing the entire system by which telephone numbers are assigned, *Network World* has learned.

The move is aimed at preventing users from the cost and time of having to change phone numbers within data and voice telephony devices because their area codes change every few years.

FCC officials and outside experts say the reason why carriers keep carving up new area codes — 47 scheduled across the country in 1999 alone — is not an overwhelming demand for phone numbers, but a woefully inefficient system.

Every time a competitive local exchange carrier enters a market, the carrier can request numbers only in blocks of 10,000, even if the CLEC has only a handful of customers. That's because current telco switching systems only examine the first six dialed digits — the area code and exchange — to determine which local carrier will terminate a call. As a result, all 10,000 possible numbers in an exchange must be assigned to the dominant carrier or one of potentially dozens of competitors.

The area code-shortage problem is especially acute in California, where 20 of the state's 24 area codes have been placed in "jeopardy" status by the North American Numbering Plan Administration (NANPA), meaning new numbers must be conserved and may be hard to come by until a new area code comes into play. Numbers are being assigned to carriers by lottery in 17 of those area codes, the California Public Utilities Commission (PUC) revealed last week.

To relieve the problem, California has 16 new area codes slated for introduction over the next three years. "California is splitting area codes like rabbits have babies," says Lee Selwyn, president of Economics and Technology, a consulting firm in Boston that works for several user groups.

But NANPA says that solution is a band-aid. When the nation began using nontraditional area codes in 1995 — those without a 0 or 1 in the middle — NANPA estimated that the new area codes could hold out until 2025. Now NANPA says the country could run out of area codes as early as 2007 if carriers continue to assign new area codes at the current pace.

State regulators are concerned, but they partly blame the FCC for the problem. Last week the California PUC issued a consumer advisory saying the PUC would like to implement a new system called number pooling to solve the problem. In number pooling, up to 10 carriers can share 10,000-number blocks, each getting 1,000 numbers.

But state regulators noted that the FCC so far has prohibited state regulators from forcing local carriers to participate in number pooling trials. And, the PUC says, "Pacific Bell and GTE California are not willing to volunteer." A Pacific Bell spokeswoman told *Network World* a trial would be "costly and premature" because the FCC is about to make a new numbering proposal. GTE officials did not respond. ◪

Correction

The price quoted for the ProLiant 6500 ("Xeon packs server punch," April 5, page 38) was for a server with 512K-cache processors rather than 2M-byte cache processors.

The price of the unit as tested is $50,286.

NPI lowballs Layer 3 switch pricing

Company's versatile ASICs drop Layer 3 Ethernet switch prices by 30% to 40%.

BY JIM DUFFY

MILPITAS, CALIF. — Network Peripherals, Inc. (NPI) is about to lower the bar on Layer 3 switch pricing with the introduction of its 10/100M bit/sec and Gigabit Ethernet switches.

NPI will roll out several stand-alone Layer 3 switches for small and mid-size businesses. The switches are based on what the company says is a flexible hardware architecture that can easily be reconfigured so devices can be redeployed to meet different application needs. It is this architecture, called NuWave, along with NPI's manufacturing efficiencies, that will allow the company to offer Layer 3 Ethernet switches at 30% to 40% below the current lowest list prices, says Jerry McDowell, NPI's vice president of marketing.

Other vendors usually develop Application Specific Integrated Circuits (ASIC) that are unique to specific switches and cannot be reconfigured for different switching applications, McDowell says.

"Customers can define the NuWave product any way they want, and we can respin it in three months," he says.

Analysts say the flexibility of NPI's architecture is unique, but they caution that end users may not see the price benefits. NPI sells its hardware to OEMs and value-added resellers that might price the switches in line with other vendors' switches, says Mike McConnell of Infonetics Research in San Jose.

One problem for NPI may be that price is becoming less of an issue for users, McConnell says. Users are putting more emphasis on features and service, he says, and that's where large vendors may have NPI beat. When it comes to policy management, Layer 3 switching and quality-of-service (QoS) features, NPI's switches are pretty standard, he says.

But the versatility of the NuWave architecture is anything but standard. NuWave is a nonblocking switching system based on proprietary ASICs NPI says it can use to configure a family of managed switches with up to 64G bit/sec of bandwidth that forward Layer 2 frames and Layer 3 packets at wire speed.

Typically, vendors offer different switches for a variety of applications, and each device is based on unique ASIC architectures, NPI's McDowell says. This hardware incompatibility keeps prices high because vendors have to fund separate internal development teams to design the distinct ASICs, he adds.

Not so with the NuWave switches, McDowell claims. NPI will offer its proof this week when the company unveils the Keystone 24g, a 24-port 10/100 Layer 3 switch with two Gigabit Ethernet uplinks. NPI will follow with a slew of other switches (see chart).

The Keystone 24g can serve as a workgroup concentrator for wiring closets or as a collapsed backbone switch in small and mid-size companies. Layer 3 IP routing is based on Routing Information Protocols 1 and 2, and performs at 6.5 million packet/sec.

The switch supports 802.1p for priority and QoS, 802.1Q for virtual LAN tagging, and the Internet Group Management Protocol for multicasting. For VLANs, the Keystone 24g snoops the protocol layer of every packet and creates a VLAN based on protocol type, NPI says.

The Keystone 24g carries a list price of about $6,600 with the two Gigabit Ethernet uplinks, $4,700 without. That drops the per-port price for Layer 3 10/100 to about $195.

NPI: (800) 674-8855

Network Peripherals' new switch line-up

Product	Description	Price
Keystone 24g	24-port 10/100 Layer 3 switch with two Gigabit Ethernet uplinks.	$6,600 with two Gigabit Ethernet uplinks, $4,700 without.
Cornerstone 6g	Six-port Layer 3 Gigabit Ethernet switch with expansion slots for six additional Gigabit Ethernet ports, 16 10/100 ports or two WAN modules.	Less than $1,000 per Gigabit Ethernet port.
Keystone 24mg	Stackable 64G bit/sec switch with 22 10/100 ports and expansion slots for 10/100 Gigabit Ethernet or WAN ports.	Not available
Capstone 24t	Stackable switch with 22 fixed 10/100 ports, and two copper 10/100 or fiber 100M bit/sec ports.	Not available
Capstone 8f	Stackable switch with six fixed 100M bit/sec fiber ports, and two optional copper 10/100 or fiber 100M bit/sec links.	Not available

NOTE: All of the switches will be available in the third quarter.

Microsoft rallies Windows 2000 charge

BY CHRISTINE BURNS

Microsoft is pulling out all the stops to get corporate users to adopt its less-than-complete Windows 2000 code.

The software giant has convinced some 75 vendors to support its Beta 3 package — which is expected to be released this week at Comdex/Spring '99 in Chicago. The number of vendors supporting the package is more than most NOS competitors manage to amass when they ship complete products.

Microsoft officials claim easy access to Beta 3 code will give corporate users a better feel for how Windows 2000 will work inside their networks. Sources close to the company say Beta 3 contains no new features over Beta 2 but is far more stable, and has better setup utilities and improved device driver support.

But some analysts say Microsoft's announcement is an attempt to get large-scale customers to kick the tires to see if Windows 2000 will live up to the scalability promises the company has made.

"With the endless delays and rumors that applications were not running well on top of it, Microsoft could smell an awful air of discontent surrounding Windows 2000," says Laura DiDio, an analyst with Giga Information Group in Cambridge, Mass. "They had to do something to get more people to look at this stuff fast."

Specifically, Microsoft has convinced several hardware partners, including Hewlett-Packard, Unisys and IBM, to preinstall Windows 2000 Beta 3 as an option on their workstations and servers delivered to corporate customers.

Microsoft's channel of Certified Solution Providers will be offering a new Beta 3 deployment program targeted at corporate customers, who can get the beta code, a pile of supporting documentation and limited technical support for $59.95. Early adopters will receive coupons allowing them to upgrade to the final product for free when Microsoft releases it sometime in October.

On the application side, more than 75 independent software vendors (ISV) have announced that their directory administration tools, back-up utilities and net management software will support production Windows 2000 machines.

Additionally, Microsoft has attempted to allay fears that existing applications won't work on top of Windows 2000. The company is promising to deliver an application catalog for Windows 2000 this week that will list which Windows applications have been certified to run on the new operating system.

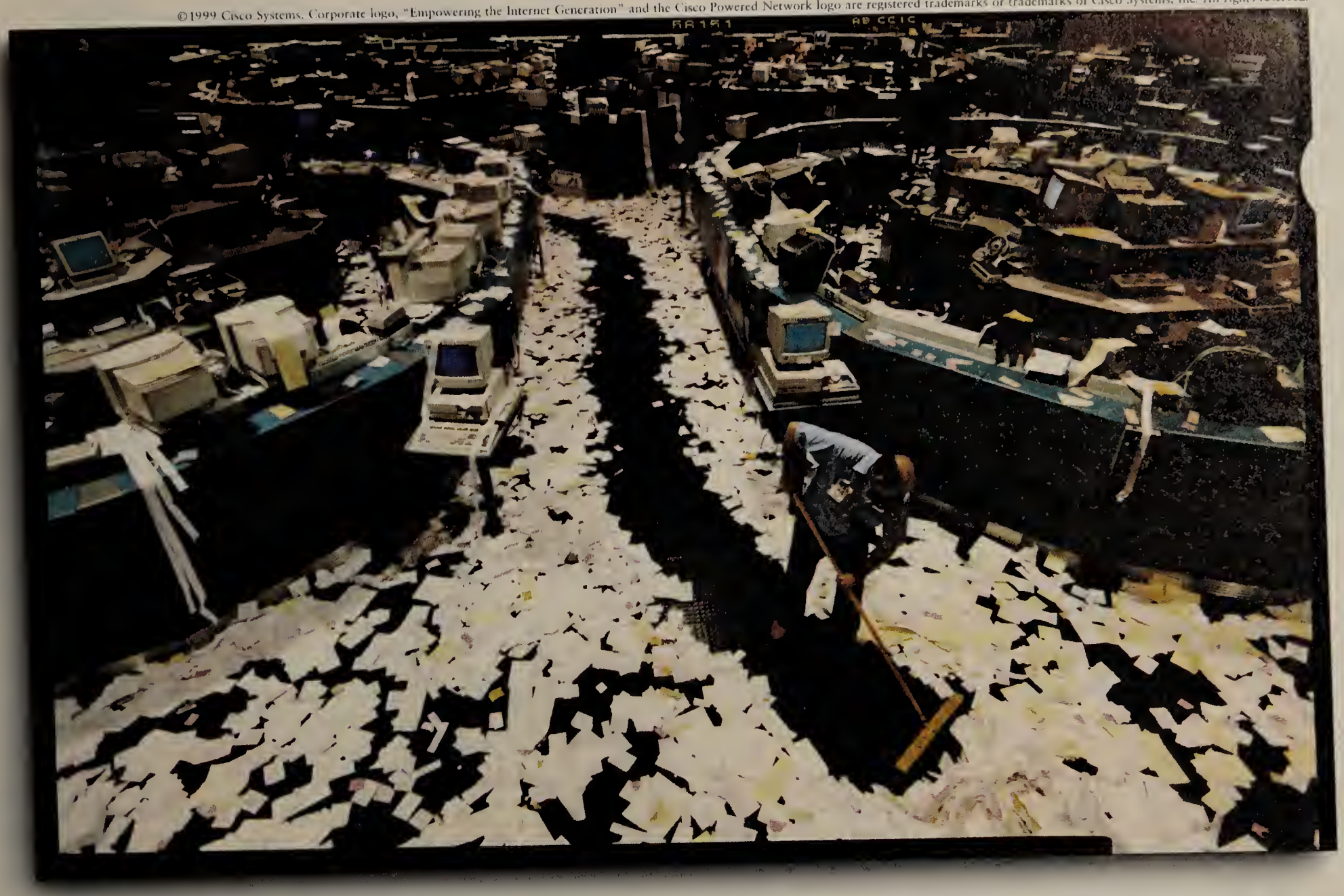
COMDEX Spring '99

Microsoft ISV FastLane Technologies is planning a release of its NT domain consolidation and management tools that will help users migrate existing NT 4.0 and Banyan VINES servers to Windows 2000 Beta 3 servers. FastLane has been working with users enrolled in Microsoft's rapid deployment program — a group of large customers who have agreed to put Windows 2000 beta code in production in exchange for early access to the code and a lot of technical hand-holding.

Users who aren't already enrolled in the rapid deployment program say they still aren't swayed enough to deploy any beta product — especially one containing nearly 40 million lines of code — across their enterprise networks.

"That sounds suicidal to me," says one network consultant working with a large corporate client in the St. Paul, Minn., area. "Just because Microsoft has convinced its partners, who stand to gain millions by prematurely supporting a new operating system, doesn't mean I am willing to risk my job."

"I have no plans to rush into Windows 2000 either," says Larry Bradley, senior network engineer with the Georgetown University Business School. "I'll wait until 2001 or 2002, when other people have already hammered out the bugs, before I make any move to it." ◪



We know a service provider

that delivers global financial news

to 16,000 places every minute.

In the New World,

information never sleeps.

Cisco Powered Network℠

The sun never sets on the global marketplace. Especially for a major business news wire that reports the latest breaking financial news to business leaders in 24 countries. So it's no accident that it relies on a Cisco Powered Network™ service provider.

Welcome to the New World – where Cisco Powered Network service providers are changing the way people share ideas and information in extraordinary ways. Impressive, but not surprising when you consider that virtually all Internet traffic in the world travels across the systems of one company. Cisco Systems. We can help you achieve the same exceptional results for your business. Look for the Cisco Powered Network mark or visit us at www.cisco.com/cpn.

We'll match you with a Cisco Powered Network service provider who can reliably extend your network over a Cisco-based infrastructure. And beyond.

Cisco Systems®
Empowering the Internet Generation℠

Users wait for ISPs to sort out monitoring tools

Customers refrain from putting critical information on the 'Net until they can track ISP performance themselves.

BY DENISE PAPPALARDO AND SANDRA GITTLEN

LOS ANGELES — While ISPs are urging customers to put mission-critical data on the 'Net, you would have been hard-pressed to find service providers at last week's Spring Internet World '99 show with tools for letting users monitor that traffic.

Users want tools to monitor traffic latency, packet loss and network availability of multiple dedicated Internet access connections. Because ISPs have been slow to roll out those packages, users such as Bill Carr at the Federal Aviation Administration have put the brakes on their Internet plans.

Carr, a radar systems specialist, says the FAA is considering using the Internet as an alternative to its current dedicated links as a way to reduce sky-high telecom costs. But Carr says he wants to closely monitor any classified data, such as secure flight information, that he would be sending across the wires.

"If Web monitoring tools were in place, that would impact our decision to begin using the Internet," he says. "Just knowing providers had the tools would make me feel more comfortable about signing off on a service-level agreement for mission-critical data."

Bob Dougherty of Subaru America agrees. He is setting up an extranet for the car manufacturer's 600 franchise owners. Keeping track of traffic over the Internet is essential to the project's success, says Dougherty, chief information officer and IT director at the company's headquarters in Cherry Hill, N.J. Subaru dealership owners will be filing warranty information, and ordering parts and supplies over the Internet.

But like most users, Dougherty's choices are limited. In fact, even the largest ISP in the world, MCI WorldCom's UUNET, does not offer customers real-time monitoring tools.

UUNET customers get one of the best SLAs on the market, with the guarantee of 100% network availability and round-trip delay of no more than 85 msec. But users are at the mercy of UUNET to verify that SLAs have been met. UUNET says offering tools that let users peer into its network would be a security risk.

But Dwight Gibbs, chief technical fool at The Motley Fool, believes some ISPs are dragging their feet because they aren't prepared to give users software that might make the service providers look bad from a performance standpoint. Gibbs wants a Web-based tool that provides trend data such as end-to-end speed and throughput information, he says.

UUNET offers users a site that states the average monthly round-trip latency of traffic over its network. But the usefulness of this information to back up SLAs is questionable at best. Users need tools that would tell them now — not in one month — if their packets are being delivered.

STAN BAROUH

Gibbs: ISPs may be holding off on monitoring tools because the tools might make them look bad.

UUNET's prime competitors AT&T WorldNet, Intermedia Business Internet and Cable & Wireless USA aren't offering their customers much more. The ISPs have Web sites that show congestion points on their networks. AT&T WorldNet's site also shows network packet loss. Concentric Network is opening up a performance Web site next week.

Still, the information on these sites is skewed because the ISPs offer statistics only from a small percentage of their routers.

Research efforts at AT&T Labs may improve the situation. AT&T WorldNet is test-driving the labs' network monitoring tool called Netscope, which AT&T Labs researchers discussed last week at Internet World. Though AT&T WorldNet is not yet using the tool on its commercial network, AT&T Labs says the tool could be fully deployed in WorldNet and other ISPs within the year.

With Netscope, ISPs could create a detailed analysis of traffic that they could offer to users. Netscope looks at the source and destination of packets on certain links and is able to identify exactly where congestion is occurring.

Tools such as Netscope could help ISPs back their SLAs with real-time statistics, AT&T Labs says. ◪

Reporter's Notebook

SPRING INTERNET WORLD '99

Here's a sampling of sights and sounds from last week's show.

Behind the curtain

As trade-show carnival barkers go, you really can't beat Webster, America Online's chatty wandering robot. The 4-foot-tall bucket of bolts scampers about the show floor engaging attendees in a witty dialog that seems far too real to be robotic. Ask Web how he does it, and he'll tell you, "It's over the Internet" and that "I'm really back at the hotel with my feet up drinking martinis."

Well, *Network World's* crack investigative team has pulled the curtain back on this windy wizard. See that guy talking on the cell phone over there trying to look inconspicuous? No, not that one, the other one. He's the real voice of Webster.

Burning down the house

Success and a willingness to change go hand-in-hand for companies just entering the Internet economy. Here's what conference chairman Jack Powers said about the matter at a session on the future of electronic commerce: "Sometimes the best e-commerce strategy is to burn your old company to the ground and start fresh tomorrow with a bunch of teen-agers."

The line drew a big laugh, but it may have been nervous laughter given that a crackling fluorescent light had earlier filled the room with an acrid odor that had heads turned upward looking for smoke.

Bird brains

The Los Angeles Convention Center was not only jam-packed with Internet highfliers, but also with a few of the ornithological kind. The feathered ones seemed comfortable flitting from table to table.

"It's amazing what you see at these conferences," one amused attendee said.

What kind of birds, you ask? Sorry, you're reading *Network World*, not *Bird Watchers Weekly*.

Mailing it in

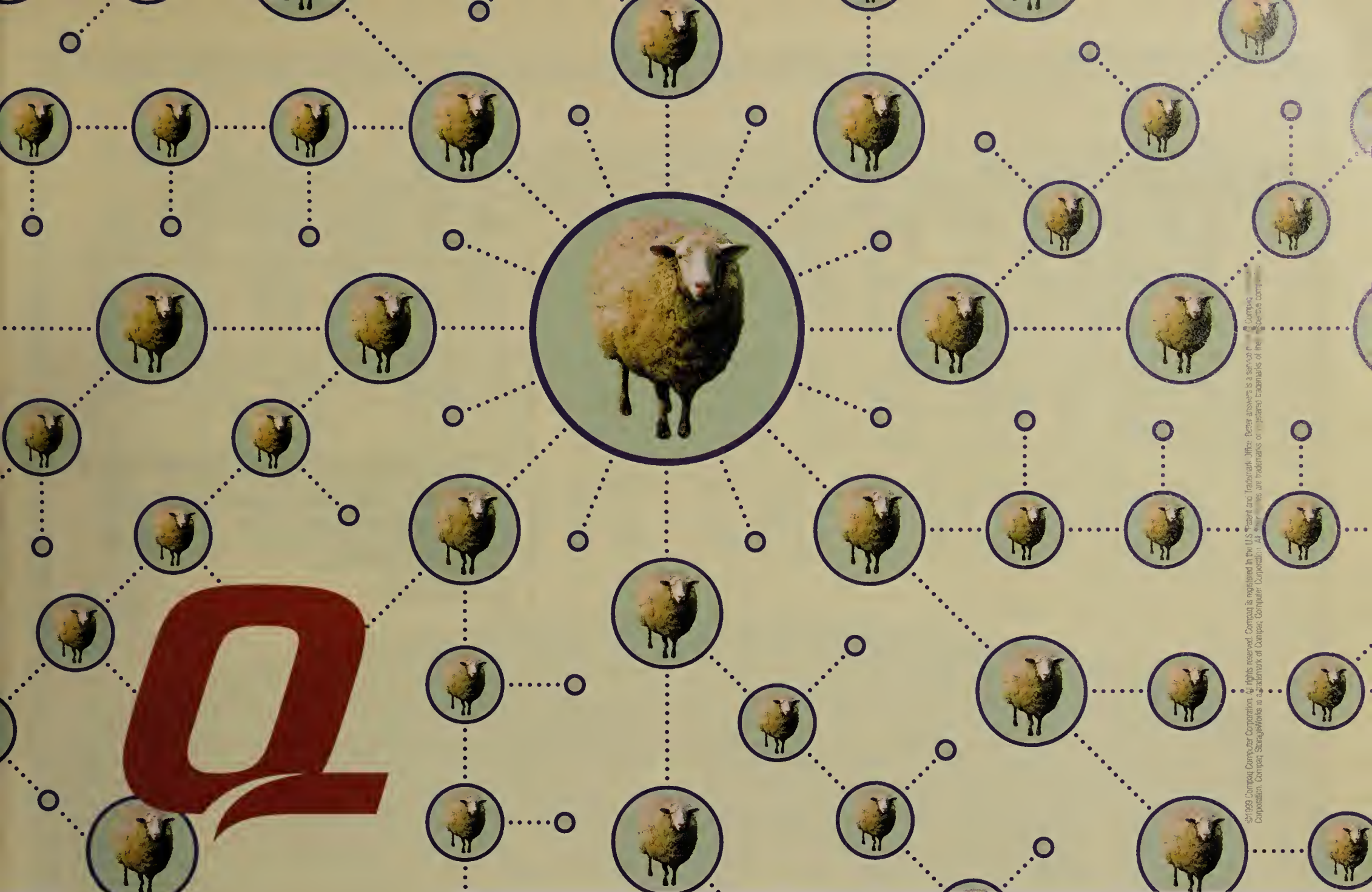
They were close enough on the show floor to have lobbed packages at each other, yet they were light years apart in terms of projecting that all-important Internet image. One might not expect to see UPS or the U.S. Postal Service at Internet World. UPS seems to be well on its way to changing that perception, however, with a snazzy "moving at the speed of e-business" campaign, digital file delivery services and tools for UPS-enabling Web sites. The Post Office had stamps, boxes and 15 booth staffers doing their best to look busy.

***E.R.*: The Virus Episode**

The antivirus folks from McAfee were decked out in hospital scrubs as they staffed their booth. Get it? Virus fighters? Medical garb? . . . Just to be annoying, we went over and asked if anyone had seen Melissa lately.

— Paul McNamara

For coverage of Internet World keynotes, announcements and other news, visit www.nwfusion.com, DocFinder: 2560.



When my data multiplies like crazy, will I be able to handle it?

The data in your enterprise is being cloned more rapidly than sheep are, these days. And the growth of the Internet is taxing your storage system even more. That's why you need a storage system that grows right along with it. Compaq StorageWorks.™ Designed with our open, standards-based Enterprise Network Storage Architecture, it gives you a modular storage solution that expands with your enterprise. And this architecture virtualizes storage—working across multiple platforms while being centrally managed from one location. So information can be shared by anyone anywhere in your enterprise. For answers to all your questions about multiplying data, contact 1-800-STORWORK or www.compaq.com/yourdata.

COMPAQ Better answers.℠

Microsoft urged to beef up thin-client support

BY JOHN COX

Some Microsoft customers and integrators are complaining that the company's support for its thin-client software is spotty.

The gripes are surfacing as Microsoft prepares to launch the latest test version of Windows 2000, which will have built-in thin-client code.

At one large company, plans to deploy the current thin-client product — Windows NT 4.0, Terminal Server Edition (TSE) — have stalled while MIS managers sort out differences with Microsoft. Meanwhile, systems integrators and other Microsoft partners say the company needs to put more muscle into its TSE marketing and improve technical support to meet corporate MIS needs.

TSE is a multiuser version of NT 4.0, based on code licensed from Citrix Systems. The software provides many users with access to the same NT applications on one server, instead of running the applications on hundreds of separate desktop computers.

TSE users cite a litany of complaints against Microsoft, including: little Microsoft advertising and marketing of TSE; a difficulty in getting technical information; untrained or hard-to-reach tech support staff; a continued lack of cooperation among different groups within Microsoft, such as salespeople, reseller representatives and tech support; and restricted access to Microsoft's tech support Web sites.

Critics complain that Microsoft's thin-client marketing has been ineffective. The sales director at one integrator says he routinely briefs corporate MIS groups about TSE, and their responses, every time, have been: "Why haven't I heard about this?"

Kevin Yang, vice president of sales for TeleVideo, which sells a line of Windows-based terminals that work with TSE, met with the NT team two weeks ago, urging the team to be more aggressive in marketing the benefits of server-based computing.

"The Microsoft guy said, 'Well, we're very resource-constrained here,'" Yang says. "He said they had $2 million to market and promote TSE. I said, 'Excuse me? Are you kidding?' That was a low blow to me."

Microsoft Product Manager Solveig Whittle declined to get specific about the company's TSE marketing and promotions budget, but says, "It is certainly more than the number you were given." Whittle says that while her group has a budget, TSE also is directly and indirectly promoted by other groups within Microsoft. "What we spend is right in line with what we spend on other businesses of this size," she says.

Another complaint by some customers is that it's hard to find information about the technical innards of TSE, TSE performance and operations. "All the information I have obtained about TSE has been through consultants, who have had trouble getting information," says Rich Walsh, network administrator with Thompson Machinery Commerce in Nashville, Tenn. "There is very little information on the Microsoft Web site, and no Terminal Server classes to be found."

Whittle says there is an extensive online database of information available to customers. A special Web site for Microsoft Certified Solutions Providers lets thin-client hardware, software and services vendors advertise their offerings.

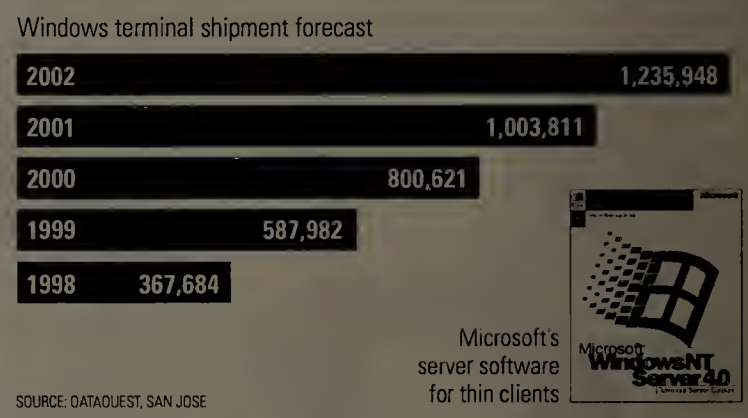
Spotty and unprofessional tech support is another gripe of some customers. William Jones, president of OSIA Technologies, a Canadian systems integrator, says several customers were trying to find a spooler driver that would correct an annoying TSE feature. Frustrated by waiting for the Microsoft tech support hotline and unable to get the driver from Citrix, whose representatives said it was a Microsoft problem, the users solved the problem themselves.

"One soul called Microsoft, got the driver and e-mailed a copy to all who needed it: He became the FTP site for Microsoft patches," Jones says.

See **TSE**, page 80

Fast growing Windows terminals

Corporate users see benefits to server-based applications accessed by Windows terminals, as these projections show. But users would like to see Microsoft put more marketing and support muscle behind its Windows NT Terminal Server Edition.



Compaq steals IBM's e-business buzzword

But Compaq's first-quarter revenue shortfall raises concerns.

BY DENI CONNOR

HOUSTON — Bill Gates was Compaq's best e-business salesman last week at Compaq's Innovate Forum 99, an event overshadowed by the company's current financial woes.

Compaq copied the e-business term from IBM, which has spent millions popularizing it. Compaq's NonStop eBusiness program is designed to help its customers offer a 24-7 Internet marketplace. According to Compaq CEO Eckhard Pfeiffer, NonStop eBusiness products will run on Compaq's Alpha and Intel-based servers, along with a range of operating systems, including Tru64 Unix, OpenVMS, Windows NT and Tandem's NSK.

Some attendees were more concerned about Compaq's own business, as first-quarter revenue is now predicted to be half of what Wall Street expected. Pfeiffer says the problem is trivial, and blamed it on price competition and softer PC sales in the mid-size to large business segment.

Drawing from his Digital Nervous System mantra, Microsoft's Gates spoke of an interconnected world of knowledge workers with the customer at the center. Gates also praised Compaq, gushing that "there is no more important partner [for Microsoft] than Compaq."

Some users were unmoved by Compaq's eBusiness strategy, or Microsoft's support. "I have no idea what Compaq was talking about," said a manager for a large IT services provider.

While most of the messages Compaq officials gave at the conference seemed painstakingly rehearsed, there were a few crossed wires. For instance, some Compaq executives had nothing but good things to say about Intel's 64-bit Merced chip and the Monterey 64-bit operating system being developed by IBM, Sequent Computer Systems and The Santa Cruz Operation. These products, along with the upcoming 64-bit version of Windows NT, will help Compaq offerings compete against other high-end servers, officials said.


JOHN ABBOTT

Compaq CEO Pfeiffer blames firm's revenue shortfall on price competition and soft sales.

But executives from Compaq's Tru64 Unix operating system division weren't as thrilled. "Frankly, Merced doesn't look too interesting as a volume platform," said Don Jenkins, a vice president for Compaq's Unix business segment. "I don't think it will have the performance. The compilers will still be somewhat immature. We'll provide a port [of Tru64 Unix for Merced.] People will try it. Independent software vendors will port to it. But I don't think Merced will be a strong price-performance competitor to Alpha."

In other news, Compaq introduced a series of single-function network appliances targeted at the consumer and mobile markets. These server appliances will initially be aimed at Web caching and file storage, and will ship in 90 days (see story, page 26). ◪

THE BOYS IN ACCOUNTING ARE WATCHING DEBBIE IN ACTION. YOU'RE WATCHING A LAWSUIT IN ACTION.

INTERNET ABUSE DOES MORE THAN WASTE YOUR COMPANY'S BANDWIDTH AND CAUSE NETWORK DELAYS. It can open you up to a lawsuit. The CommandView product family from Elron Software saves your company—in more ways than one. For instance, CommandView products can monitor, report, and block inappropriate material from the Web, e-mail, and newsgroups. So you can identify network abuse and enforce Acceptable Usage Policies. They also let you prioritize network traffic, so important applications always get through. And unwanted visitors and offensive content stay out. To learn more about Elron's best-of-breed CommandView products—or to order your free interactive CD—visit www.elronsoftware.com/cd, or call 1-800-767-6683. And watch us in action.

ELRON SOFTWARE

MAXIMIZING INTERNET PRODUCTIVITY

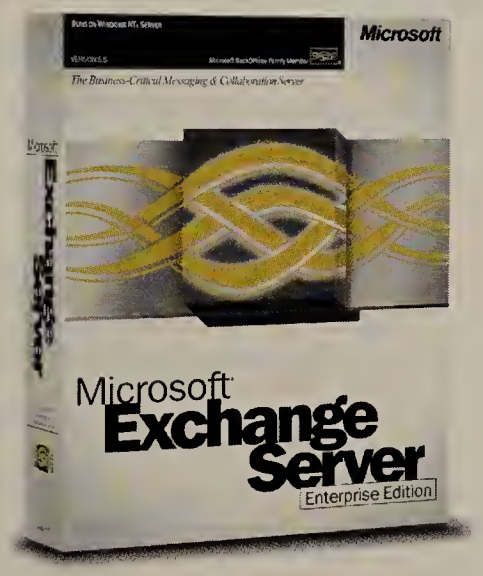
Elron Software Inc. · One Cambridge Center · Cambridge, MA 02142 · Tel: (617) 914-5000

TCO less than half of Lotus Notes.

Better than 99.9% reliability.

More than 25 million users in 3 years.

Just a few facts* to help you with your messaging and collaboration server decision.



As you evaluate the best messaging and collaboration server on which to standardize your IT infrastructure, you want the facts to make the best long-term decision for your company. With Microsoft® Exchange Server you get low TCO, high availability, and high scalability. Plus, Exchange is a choice that puts you in good company, with widespread adoption among such demanding enterprise customers as Dell, Merrill Lynch, Northrop Grumman, Siemens, and Toys "R" Us. If you need more facts or to get your free Exchange Evaluation & Migration Kit, visit **www.microsoft.com/exchange/**

Microsoft
Where do you want to go today?®

Reliability results vary based on server hardware, server software, performance monitoring and adopting best practices for operations. [3]Electronic Mail and Messaging Systems Newsletter, February 5, 1999 and data from Microsoft

Nortel snags Shasta to enhance billing

BY DAVID ROHDE

SUNNYVALE, CALIF. — Developing usage-based billing for next-generation IP networks can be quite a headache. Nortel Networks last week got serious about alleviating the problem.

The company bought Shasta Networks, a start-up based here that specializes in IP gateways and service provisioning systems placed at the edge of IP carrier networks. Shasta's systems track usage, authorization and other elements to add needed features to IP virtual private networks (VPN).

Shasta's Subscriber Service System (SSS), sold to service providers, is a highly scalable network-edge collection of hardware and software that can aggregate tens of thousands of subscribers and track their traffic volume. The package can also extend quality-of-service distinctions to different classes of IP VPN services that carriers may want to offer users.

In addition, SSS can be manipulated to let IP service providers offer custom services with different levels of authentication, encryption and authorization, as demanded by users.

Nortel will pay up to $340 million in stock and cash for Shasta. The exact payment depends on what Nortel labeled as Shasta's ability to achieve "certain business objectives."

Shasta co-founder Anthony Allcs says he hopes the Nortel connection will help generate sales, while Nortel officials say they were looking for provisioning systems to match recent investments in IP optical systems and gigabit-class routing switches.

PROFILE: SHASTA NETWORKS

Headquarters:	Sunnyvale, Calif.
Founded:	March 1998
Products:	IP service provisioning hardware/software platform and management systems
CEO:	Wu Fu Chen, co founder and former vice president of engineering at Cascade Communications
Employees:	48
Fun fact:	Company name comes from Mount Shasta, the tallest peak in the California Cascade range

IBM adds policy mgmt. to application layer

New software eliminates the need for multiple policy servers.

BY MARC SONGINI

RESEARCH TRIANGLE PARK, N.C. — Big Blue is adding another level to its policy-based management technology — one that works at the application layer.

IBM claims its application-driven network initiative will more closely tie policy management and security to a company's business processes. Plus, the initiative gives centralized control of net management, reduces maintenance costs and improves overall performance.

This Tuesday, IBM will announce a key part of its plan — the common policy engine. This software sits on network gear and helps implement quality-of-service (QoS) and security decisions, based not just on IP addresses and ports, as is currently done, but also on the type of application being accessed. This way a user perusing ESPN.com doesn't get the same priority as, say, a person accessing crucial financial data.

The common policy engine will be bundled into IBM's 2210 Multiprotocol Router, 2212 Access Utility, 2216 Mutliaccess Connector and Network Utility devices in June; later the technology will extend to IBM Ethernet and ATM switches.

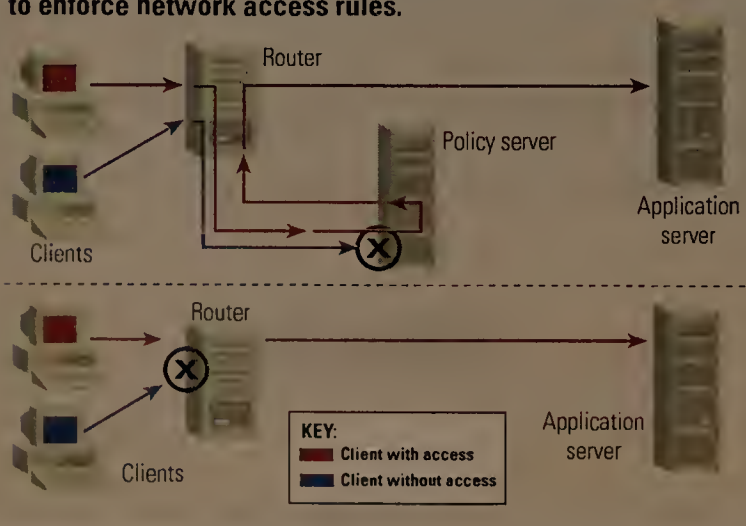
The common policy engine has a patented rapid-classification algorithm that gives a 25-fold boost to the speed of IBM hardware when processing IP packets. When evaluating incoming traffic, the policy engine will access Lightweight Directory Access Protocol security and prioritization profiles contained on the device.

If an end user queries the network for data or application access, a common policy engine-enabled router will decide if the network's resources should be made available, and if so, how much. The router will make this decision without having to access a dedicated policy server, such as a Windows NT box. Eliminating this step speeds network performance and cuts the number of policy servers required — usually one policy server is needed for every five routers. With a single central policy server, such as an S/390, equipped with the engine, users could save hundreds of thousands of dollars annually. With the common policy engine, all policy setting can be performed from a central point using, for example, Tivoli's Global Enterprise Manager on an S/390.

The common policy engine enforces policies for virtual private network (VPN) tunneling; Differentiated Services, which prioritizes traffic based on packet headers; and Resource Reservation Protocol, which preallocates bandwidth to certain types of traffic. IBM claims it has added an extra layer of security by encrypting VPN data at the application server — not merely at the network edge as with other offerings. IBM says it will submit the common policy engine to a standards body so other vendors can exploit the technology.

Changing policy technology

New IBM technology eliminates the need for intermediary policy servers by enabling routers to enforce network access rules.



Typical policy management method
A policy server stores data on end users' network access rights. The server checks this data to determine whether end users should be given or denied access to applications.

IBM's policy management engine
Policy decisions are made by an IBM common policy engine on a router that also stores end users' access rights data. The router checks this data to determine whether end users should be given or denied access to applications.

NetworkWorld

Editor in Chief: John Gallant
Editor: John Dix

NEWS
News Editor: Doug Berney
News Director: Bob Brown
Associate News Editor: Michael Cooney
(508) 875-6400

NETWORK WORLD FUSION
Online Editor: Adam Gaffin, (508) 820-7433
Senior Online Reporter: Sandra Gittlen, (508) 820-7431
Staff Writer: Jason Meserve, (508) 820-7567
Online Copy Editor: Sheryl Hodge
(508) 820-7532

INFRASTRUCTURE
Senior Editor: Christine Burns, (508) 820-7456
Senior Editor: John Cox, (978) 834-0554, Fax: (978) 834-0558
Senior Editor: Jeff Caruso, (650) 358-4515, Fex (650) 358-4518
Senior Editor: Deni Connor, (512) 345-3850, Fax: (512) 345-3860
Senior Editor: Jim Duffy, (508) 820-7525
Senior Writer: Marc Songini, (508) 820-7484

CARRIERS & ISPs
Senior Editor: David Rohde (202) 879-6758; Fax: (202) 347-2365
Senior Editor: Tim Greene, (508) 820-7422
Senior Editor: Denise Pappalerdo (202) 879-6745; Fex: (202) 347-2365

ENTERPRISE APPLICATIONS
Senior Editor: Robin Schreier Hohmen, (203) 459-9948
Senior Editor: Ellen Messmer, (202) 879-6752, Fax: (202) 347-2365
Senior Editor: Paul McNamara, (508) 820-7471

COPY DESK/LAYOUT
Managing Editor: Charley Spektor
Copy Chief: Melisse Shaw
Copy Editors: Lisa Kaplen Adase, John Dooley, Denise Dubie, Melissa Reyen
News Layout Editor: Lisa Kaplan Adase

ART
Design Director: Rob Steve
Associate Art Director: Tom Norton
Deputy Art Director: Allyson Nickowitz
Assistant Art Director: Paul M. Lee
Graphic Designer: Lisa Hovsepian
Online Designer: John Fischer
Infographics Researcher: Phil Hochmuth

FEATURES
Features Editor: Paul Desmond, (508) 820-7419, Fax: (508) 820-1103
Managing Editor, Features: Amy Schurr, (508) 820-7485, Fax: (508) 820-1103
Features Reporter: Neal Weinberg, (508) 820-7449, Fax: (508) 820-1103
Associate Features Editor: Susan Collins, (508) 820-7413, Fex: (508) 820-1103
Associate Features Editor: Suzanne Gasper, (508) 820-7489, Fax: (508) 820-1103

REVIEWS
Test Center Director: Lee Schlesinger (508) 820-7416
Reviews Editor: Ann Sullivan (508) 820-7408

Test Alliance Partners: Mark Gibbs, Gibbs & Co.; Joel Snyder, Opus One; Dennis Williams, ProductReviews.com; John Bass, Centennial Networking Labs; Steve Bell, Silicon Valley Networking Laboratory; Bob Currier, Duke University
Contributing Editors: Daniel Briere, Mark Gibbs, James Kobielus, Mark Miller

SIGNATURE SERIES
Executive Editor: Beth Schultz, (773) 283-0213, Fex: (773) 283-0214
Senior Editor: Julie Bort (970) 468-2864, Fax. (970) 468-2348
Art Director: Tom Norton
Deputy Art Director: Allyson Nickowitz
Senior Copy Editors: Melissa Reyen, Denise Dubie

Editorial Operations Manager: Cheryl Crivello
Office Manager, Editorial: Glenna Fasold
Editorial Assistant: Pat Josefek
Research Assistant: Deidre Massenberg

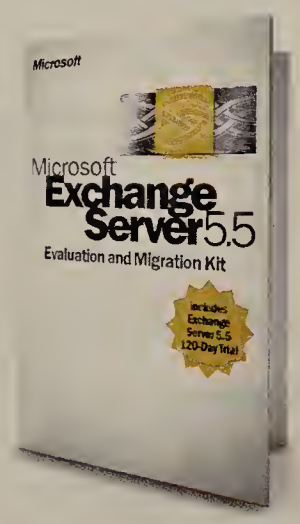
Join the cc:Mail customers who have already switched to Microsoft Exchange Server.

Find out for yourself why former cc:Mail customers such as Dell, Merrill Lynch, Northrop Grumman, Siemens, and Toys "R" Us have migrated to Microsoft® Exchange Server.

The new Exchange Migration Program is specifically designed to simplify your migration from cc:Mail, Microsoft Mail and GroupWise to Exchange, making it as seamless as possible through a complete set of tools and industry partner support. Plus, Exchange Server works well with your current messaging system so you can stage your deployment at your own pace rather than having to do it all at once. **Order your FREE Exchange Evaluation & Migration Kit today at www.microsoft.com/exchange/migration or call 888-658-7230, Dept. C626**

The Exchange Migration Program includes:

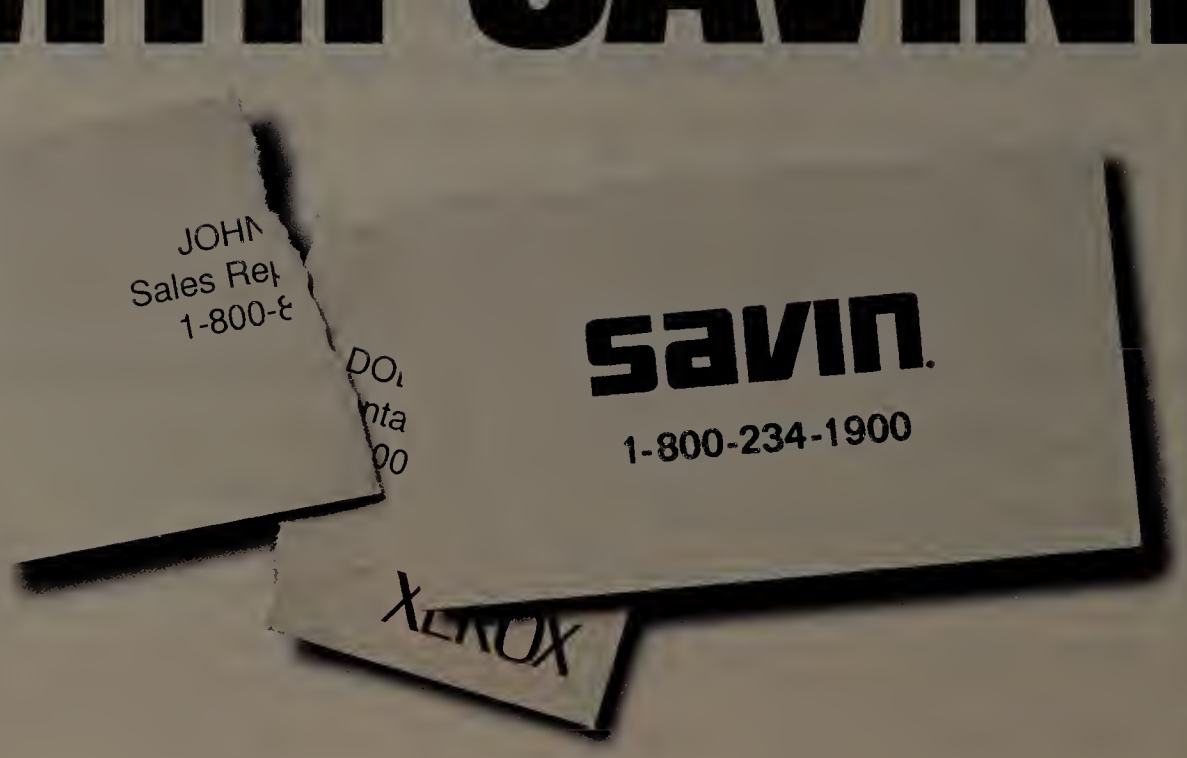
- A free migration kit that comes with a 120-day trial of Exchange Server 5.5, latest migration tools, best practices, case studies, and whitepapers
- Special discounts on migration services and seminars
- Free online how-to migration seminars
- Competitive upgrade pricing



Microsoft

Where do you want to go today?

WHY A LOT OF X-XEROX CUSTOMERS ARE CONNECTING WITH SAVIN.



(We're tearing up the competition one customer at a time.)

Why are more and more x you-know-who customers turning to Savin for their document output needs? We think the answer is that Savin has exactly what it takes to win people over.

After all, Savin not only has the award-winning, multi-functional digital imaging systems today's networked offices require, we're just as committed to becoming the fastest, most responsive name in the business. With smart, energetic, highly-trained Savin professionals willing to do whatever it takes to give you the satisfaction and service you deserve.

To find out more about Savin's full line of B&W and full-color digital imaging solutions, as well as our unshakable commitment to service, contact us at **1-800-234-1900** or www.savin.com. We think it will be the start of a great relationship.

savin®

WE'VE GOT WHAT IT TAKES TO WIN YOU OVER℠

SAVIN CORPORATION, 333 LUDLOW ST., STAMFORD, CT 06904

Infrastructure

TCP/IP, LAN/WAN Switches, Routers, Hubs, Access Devices, Clients, Servers, Operating Systems, VPNs, Networked Storage

Briefs

VIPswitch last week introduced a Fast Ethernet switch optimized to give delay-sensitive voice and video traffic priority over other traffic.

The VIPswitch 1600 gives voice and video priority over other traffic.

The eight-port VIPswitch 1600 boasts a 1.6G bit/sec backplane, features wire-speed switching at 14,880 packet/sec and supports more than 2,000 media access control addresses.

The device complies with H.323, Resource Reservation Protocol and other standards. The Montreal-based company says the device can be used to enhance the performance of videoconferencing and voice-over-IP systems from other vendors.

Pricing for the switch starts at about $2,000.

VIPswitch: (450) 923-4040

Lantronix last week announced plans to support **Sun's** Jini technology on its thin servers, which are used to tie everything from manufacturing equipment to security systems into standards-based corporate networks.

Jini provides the Java programming technology and network drivers needed to enable any two devices to communicate across networks using common applications.

Lantronix, based in Irvine, Calif., is already part of a group using Jini to enable end users to share networked printers regardless of where the printers reside.

Don't overlook remote access Y2K issues

BY TIM GREENE

Third in a four-part series.

Pay special attention to your remote access gear as you prepare for 2000, because this equipment could become your company's lifeline.

Some corporations envision a worst-case scenario in which their networks work fine next year, but transportation and public safety computer networks go haywire and prevent employees from getting to work. In such a case, employees would have to work from home, making remote access vital.

Even if you don't buy into this doomsday view, you'll probably still be increasingly dependent on your remote access network in years to come.

While your remote access hardware will likely keep on ticking at the turn of the century, the software for these devices could cause problems if not upgraded for Y2K compliance — this according to our survey of Y2K service vendor Infoliant's online hardware and software compliance-tracking database.

Potential remote access problems all stem from the Y2K compliance issue, in which devices display years as two digits instead of four. So when 2000 rolls around, the data these devices share with others as well as with software programs could be misinterpreted.

Such misinterpretations could invalidate systems for tracking and charging back remote access users. Also, end users whose access to corporate network resources is defined by time of day or day of the week may have trouble logging on to the network as a result of misunderstood data.

The good news is that if you have been keeping up with the software upgrades issued by your vendors, you probably already have compliant software. But you still should search vendors' Web sites for compliance information.

The bad news is that some vendors have deemed certain products too old to fix. Even though these boxes have been doing their jobs for years, you will have to buy replacements or new parts in order to assure Y2K compliance.

Cabletron, for instance, says its CSX-7010 and 7011 remote access chassis may need processor exchanges or BIOS software upgrades to bring them into compliance. Those boxes 3 years old or older are the ones you'll need to upgrade, the company says.

3Com's Total Control Remote Access Concentrator, the company's major central site remote access switch, is fully compliant. But other 3Com remote access products require upgrades.

3Com's NetServer remote access servers, for example, are fine as long as you don't try to manage them using SNMP. Because of discrepancies in the way the boxes and SNMP software tools display post-2000 dates, the products will have trouble understanding each other. 3Com claims most users don't use SNMP to manage its boxes, but the company says it will replace SNMP users' boxes with Y2K-compliant SuperStack II Remote Access Servers free of charge.

Additionally, 3Com's Access Builder 2000 and 4000 need hardware upgrades to be compliant. The company recommends that customers upgrade to the SuperStack RAS 1500.

Ascend suggests a software upgrade for its Pipeline 220 ISDN dial-up routers, even though the company says the routers should have no trouble connecting to central site servers. However, once connections are made, the routers could have trouble dealing with Remote Authentication Dial-In User Service servers used to authorize and authenticate users. Pipeline 400s are similarly noncompliant; Ascend recommends replacing them with newer models.

Ascend lists its Multiband MAX access switch as noncompliant because the device uses just two digits to display the year. But the company says the box does not use that date to calculate or process data, so performance will not be negatively affected.

Another remote access product, Shiva's Access Manager NT, stores date information as two digits. Potential problems resulting from the misinterpretation of time-related information include the following: dial-in authorization software might allow an unauthorized user to dial in during restricted times;

See **Y2K**, page 20

Paying the price

Here's what could happen if you don't upgrade your remote access gear for Y2K compliance:

- Users won't be able to establish connections between remote and central sites.
- Management of gear may prove difficult or impossible.
- Accounting information for remote access network usage could prove inaccurate.

QUICKTAKE

FlowPoint's 2200V integrated access device

FlowPoint is working with JetStream Communications to let remote offices use a single phone line to support up to four voice calls and a data connection simultaneously.

FlowPoint's 2200V integrated access device uses symmetric digital subscriber line (SDSL) and ATM technologies to turn regular copper phone lines into a broadband pipe that handles voice and data traffic.

The new box boasts four 10M bit/sec Ethernet connections, four telephony ports and one WAN port. FlowPoint 2200Vs at customer sites establish SDSL connections with JetStream multiplexers in service provider switching offices. Connection bandwidth can be as high as 2.3M bit/sec in each direction at 9,000 feet. The bandwidth drops to 384K bit/sec at 18,000 feet.

The 2200V costs $995 and will be available June 15. In the future, FlowPoint plans to add support for voice over IP and voice over frame relay as well as improved voice compression.

FlowPoint: (408) 364-8300

Netrix offers WAN boost

New 2510 combines frame relay and ATM connectivity in one box.

BY MARC SONGINI

HERNDON, VA. — Netrix is rolling out a backbone switch designed to help users build scalable multiservice networks.

The Network Exchange 2510 can handle large network aggregation requirements, such as concentrating downstream frame relay, time-division multiplexing or ISDN links to Netrix's top-of-the-line 2550 box.The product can also act as a stand-alone switch for voice, video and data traffic at a regional or large office site.

Netrix's 2510 is geared toward companies that don't need a large switch but want to run mixed traffic in one box.

The box costs about $20,000 less than the larger, more powerful Netrix 2550 switch and will compete against other voice and data boxes from Cisco and Lucent. The 2510 is aimed at corporations that don't need a huge multigigabit switch but want to be able to run multiple traffic types in one box, says Tony Morris, vice president at Netrix.

The 1.2G bit/sec capacity box comes equipped with two ATM/DS-3 slots, two switching and processing module slots, and two external module slots, which can support up to 450 software-defined ports. The ports can support speeds from 600 bit/sec to 45M bit/sec depending on the traffic and application.

The 2510 is capable of discovering the best available WAN and can also define nine different classes of service, based on factors such as the data's port of origin and destination.

IS staff can monitor, configure and operate the device with Netrix's Network Management System (NMS) software, which runs on a Sun workstation. Netrix soon will add support for an NMS browser interface, Morris says.

The 2510 is a less expensive way of increasing WAN capacity, according to Jack McDonnell, CEO of Transaction Network Services. Transaction currently uses the costlier Netrix 2550s to process credit card transactions for clients, such as American Express, which has 45 sites and 300,000 end users.

Pricing for the 2510 starts at $35,000. The product is available now.

Netrix: (703) 742-6000

Ericsson to swallow fast router start-up

Company also acquires IP PBX maker Touchwave.

BY JIM DUFFY

Ericsson last week announced it will buy router start-up Torrent Networking Technologies for $450 million in cash.

The deal, first reported by *Network World* last fall, gives Ericsson a high-capacity edge router for ISP networks. The device can aggregate thousands of circuits and feed them to an Internet core router, such as Juniper Networks' M40, which Ericsson distributes.

In addition, the Torrent IP9000 router line will help complete Ericsson's Multiprotocol Label Switching offering for IP over ATM.

Installed base

Torrent has an installed base of 50 routers in field trials and production networks at more than 25 companies, including service providers Concentric, Texas GigaPOP and Exodus. Torrent posted revenue last year of about $200,000, according to company officials.

Torrent's IP9000 routers feature 20G bit/sec of throughput with 24.8 million packet/sec performance per shelf and more than 3,000 T-1s and 120 to 360 T-3s per rack.

Torrent employees will become part of the Ericsson Datacom organization and will remain in the Silver Spring, Md., and Research Triangle Park, N.C., facilities.

More acquisitions

Ericsson also acquired Touchwave, a developer of IP PBXs, for $46 million. Ericsson's Touchwave acquisition follows similar buyouts by Cisco and 3Com. Cisco acquired packet PBX vendor Selsius Systems, and 3Com acquired NBX. ◪

Giganet gear links long-distance NT servers

BY DENI CONNOR

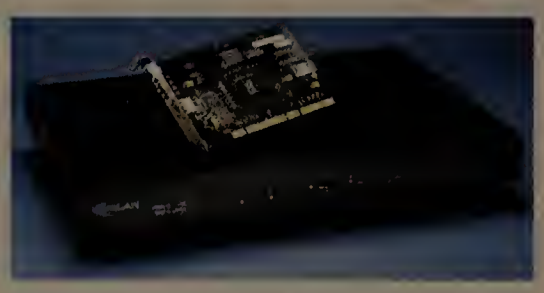
CONCORD, MASS. — Users looking to distribute business applications to far-flung Windows NT servers may want to check out new gear from Giganet.

The company last week rolled out the fiber-optic cLAN 1020 Host Adapter and cLAN 5020 Cluster Switch, which let users join Windows NT servers at distances up to three kilometers. Typical copper coax-linked servers must be no more than 30 meters apart.

Giganet is targeting the products at users who require high availability and data protection for their enterprise resource planning, disaster recovery, data warehousing or messaging applications.

The 33-MHz cLAN 1020 PCI adapter fits in a server and links to the cLAN 5020 via single- or multimode fiber. The eight-port cLAN 5020 is a 1.25G bit/sec nonblocking, full-duplex switch capable of supporting 20G bit/sec aggregate throughput over single- and multimode fiber.

Up to 30 servers may be clustered with Giganet's gear, and the products support load balancing among the distributed servers. Remote servers may be clustered on the fly by simply installing an adapter into the server and joining the server to an available port on the switch without taking down individual servers or the cluster. The switch can also automatically reroute traffic around failed devices.



Giganet's Host Adapter and Cluster Switch link NT servers up to three kilometers apart.

In tests conducted last week at the WinHEC conference, Microsoft demonstrated two clusters — a two-server Giganet cLAN configuration and an eight-server Gigabit Ethernet configuration. The two-server Giganet cluster produced more than four times the throughput of the Gigabit Ethernet cluster.

Giganet also provides a management package for configuring and monitoring the adapter and switch. The software automatically updates routing tables as new servers are brought online or removed from service.

The cLAN 1020 Host Adapter and 5020 Cluster Switch are available now and cost $795 and $7,500, respectively.

Giganet: (978) 461-0402

Y2K,
continued from page 19

accounting information used to bill departments for their remote access use might be corrupted; and user accounts scheduled to expire this year could be reactivated and allowed to stay active until 2099.

The fix? Upgrade to Shiva Access Manager NT 4.0.

Having the correct software version installed is also important for Cisco remote access gear. Cisco's AS 5200 remote access server and 1600 access router must be running the firm's IOS 11.1 operating system or a later version to comply with Y2K. The company's AS 5200 must run IOS 11.2 or later. Cisco 700 ISDN routers, on the other hand, are compliant even when using Version 4.02 of IOS.

Some Nbase/Xyplex noncompliant terminal servers also will not be upgraded. They are the 1100/1120, 1500/1520, 1600/1620 and 1800/1820 series. The company recommends going to the MAXServer eight- or 20-port server and offers a 25% discount to customers who need to trade in their old gear.

Most remote access vendors have already designed ways to get around Y2K problems — or they've decided the only way out is to buy new equipment. Check with your vendors to find out what steps to take. ◪

Next week: Y2K issues for switches and routers.

One advantage to not having old technology.

We don't have to try selling it to you.

Unlike communications companies that have been around forever, we're not stuck with an outdated network we'll try dumping on you. Whatever you need: Frame Relay, ATM or IP, Qwest is the network that delivers it better. Because Qwest is the network with bandwidth to spare. So if you're looking for a better return on your IT investments, visit us at **qwest.com** and find out why *not* having old technology can work to your advantage.

ride the light

Qwest

technology features performance

Route or Switch by Port

Multi-protocol Routing: IP, IPX, RIP, OSPF, Appletalk, BGP4 and VRRP

Layer 2/3/4 Switching

4 Levels of QoS

Multicast Support: IGMP, DVMRP, PIM

Layer 3/4 Filtering for Security

Inter-Switch Trunk Groups

Multi-Homed Servers

Hot Standby Redundancy

DHCP Assist

70 km Gigabit Ethernet Connectivity for MANs

IronSpan Meshed Connectivity

Comprehensive Network Management: SNMP, HP OpenView, CLI, Web, RMON

Now you can get Foundry's award-winning, customer-proven Layer 2/3/4 technology in a high density Fast and Gigabit Ethernet chassis. And at a price you can afford.

BigIron™ delivers up to 100,000,000 pps of Layer 2 switching and multi-protocol routing in a single device. With up to 64 Gigabit Ethernet and 184 Fast Ethernet ports, BigIron's non-blocking architecture can handle your toughest requirements. Plus, it's packed with the industry's most complete suite of features.

Best of all, BigIron won't blow your budget. You get all this and more for less than a tenth the price of traditional routers. What are you waiting for? It's time to call Foundry.

Call 1.888.TURBOLAN, email info@foundrynet.com or log into our web site at www.foundrynet.com for the sales representative nearest you.

FOUNDRY
NETWORKS

PRODUCT OF THE YEAR 1998 · DataComm Magazine TESTER'S CHOICE · 25 DataComm Magazine TOP 25 HOT STARTUPS · FLYING COLORS · NETWORK COMPUTING EDITOR'S CHOICE · TOLLY GROUP Up to Spec CERTIFIED · COMPUTERWORLD HOT 100 COMPANY · Independently tested NETWORKS AS ADVERTISED™ MIER COMM. INC. · BCR Best In Test · LANTIMES

Free Product info enter NWInfoXpress #42 online @ **www.networkworld.com/infoxpress**

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 36 WEST KINGSTON, RI

POSTAGE WILL BE PAID BY ADDRESSEE

APC
AMERICAN POWER CONVERSION

KEY CODE: j825z
Department: B
132 FAIRGROUNDS ROAD
PO BOX 278
WEST KINGSTON RI 02892-9920

How to Contact APC

Call: (888) 289-APCC
use the extension on the reverse side

Fax: (401) 788-2797

Visit: ***http://promo.apcc.com***
use the key code on the reverse side

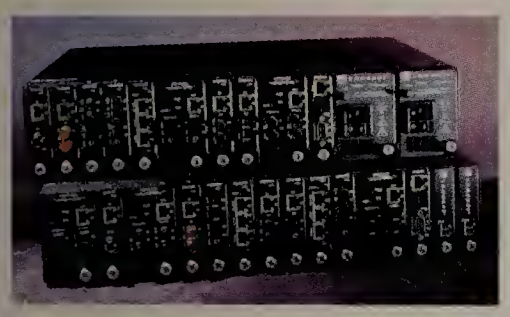
APC
Legendary Reliability™

Lancast makes media conversion more manageable

BY ROBIN SCHREIER HOHMAN

NASHUA, N.H. — Lancast last week unveiled a new line of intelligent media converters that can be remotely managed via software.

The new converters and associated software will let companies eliminate the time-consuming chore of physically searching around an enterprise network to determine whether a media converter is the root cause of a network problem.



Lancast's 7500 media converters can be managed through software that gives administrators a view of port activity.

Media converters are used to plug copper-wired switches into fiber backbones, or to translate between single-mode fiber and multimode fiber. Converters have grown in popularity as companies have installed more fiber-optic cabling.

Lancast's NetBeacon software lets network administrators read SNMP information from the company's new 7500 Intelligent Media Converters. NetBeacon employs a Java-based graphical user interface that replicates each media converter's control panel. The software can be used to find out the status of a link between a converter box and a switch and to check on environmental conditions, such as temperature, in a wiring closet.

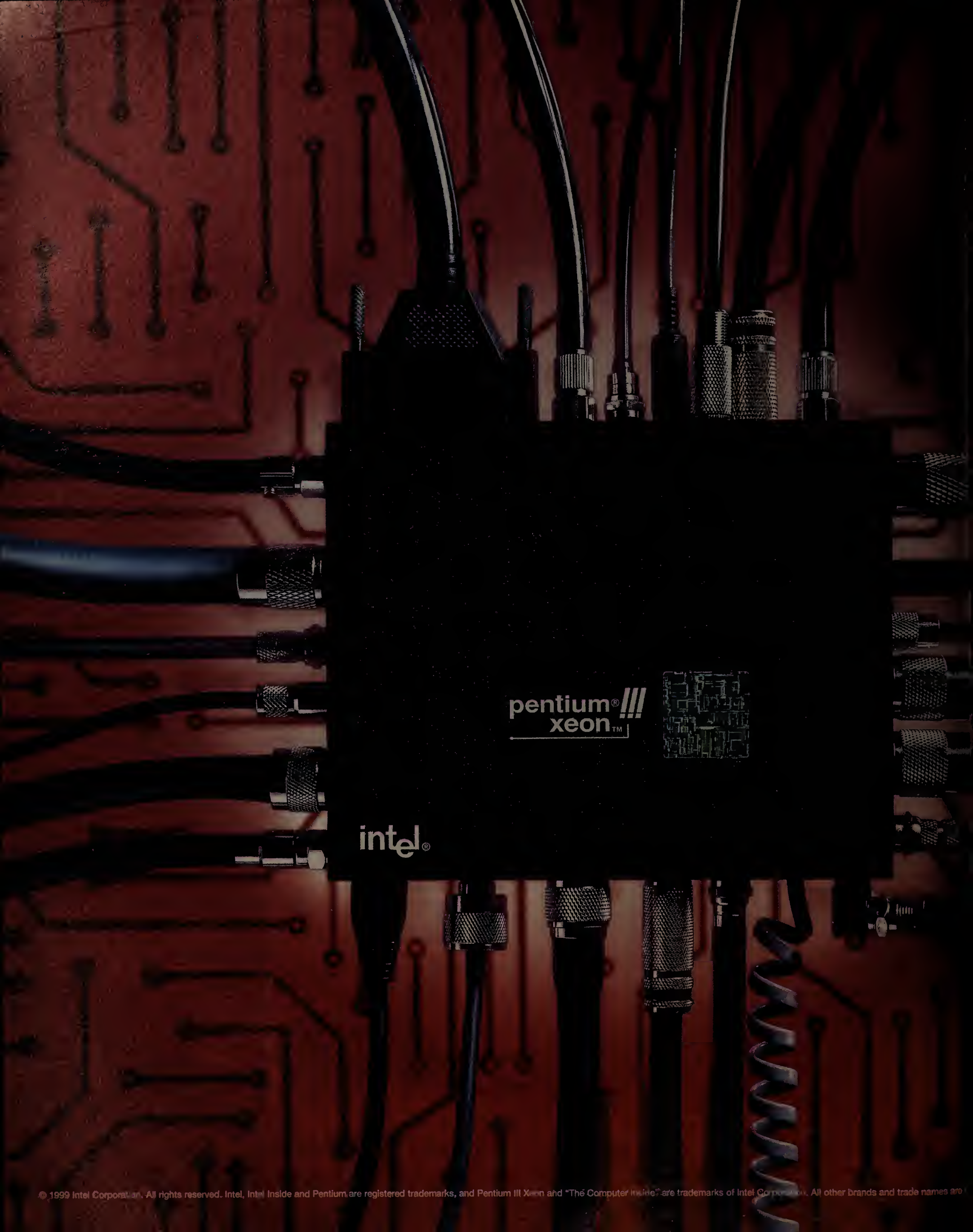
"What we're seeing with media converters today is the trend we saw in hubs, which went from dumb hubs to smart, managed hubs," says Anne Murphy, a Lancast marketing executive.

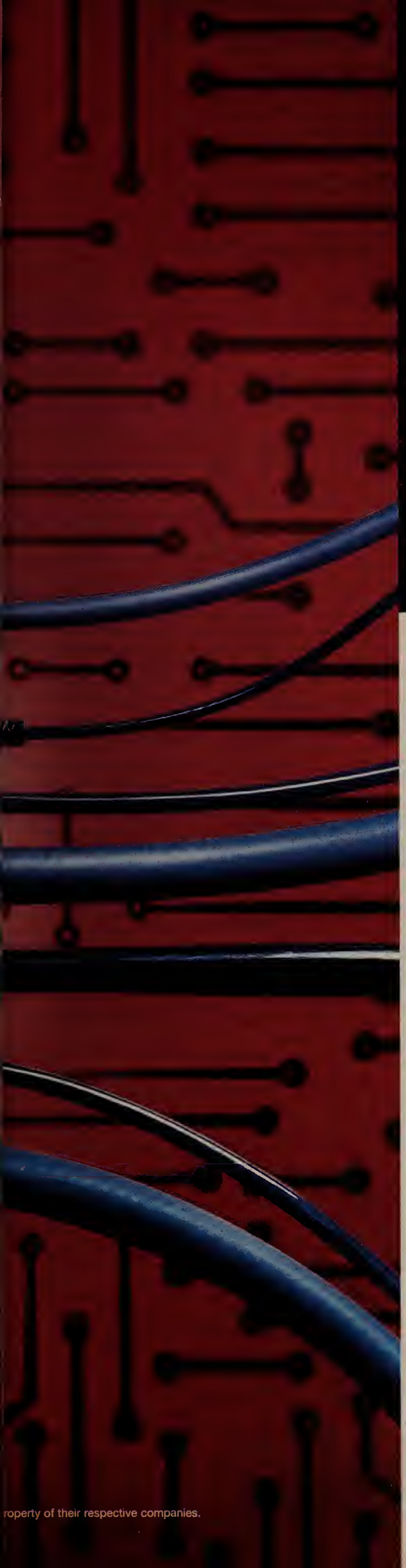
Larry Spangler, networking manager for the *Charlotte Observer* newspaper in Charlotte, N.C., uses unmanaged Lancast media converters to save money on his switches. Instead of buying his Cisco Catalyst 5000 switches with fiber ports, he buys copper ports. He says this saves him about $7,000 per 12-port 10/100M bit/sec switch module.

Spangler says he can't justify swapping his media converters now, but he foresees using the 7500s when he needs new converters. "The advantage comes when you have a problem and you need to find where that problem is," he says.

The NetBeacon software is available now and costs about $400 per single-user licensc.The 7500 line comes in 12- and 17-slot chassis models and features a variety of media modules, including single- and multimode fiber. The chassis will ship in May with pricing starting at about $400.

Lancast: (800) 952-6227





Power for the Wired Enterprise.

Introducing the Intel® Pentium® III Xeon™ processor. Performance for enterprise servers.

We're living in a wired world. And since your server is at the heart of it, the power and stability of Intel® Architecture is more important than ever. Specifically designed for today's connected enterprise, the Pentium® III Xeon™ processor is our highest performing processor for servers. Working together with Pentium® III processor-based PCs, it provides the performance and reliability you need to run your critical e-business applications. From back-end database hosting to transaction processing. On UNIX and NT. To learn more about the Pentium III Xeon processor, visit us on the Web. ► www.intel.com/it

intel®
The Computer Inside.™

Compaq developing server appliances

BY JUAN CARLOS PÉREZ

HOUSTON — Compaq is developing a line of server appliances for users interested in buying a system optimized for one particular task, the company said last week.

Knowing that the servers will be used to perform a single task will allow Compaq to tune them in a more specific way than is possible with general-purpose servers. This will improve server performance as well as make the servers more stable and easier to manage and deploy than general-purpose machines, a Compaq official says.

"Because it's a single-purpose design, we can design the server appliance for performance without any trade-offs. We can tune the hardware and the operating system and the application software for overall performance," says John Young, director of Compaq's appliance and communication servers unit.

Young spoke with the IDG News Service during a press and analyst day at Compaq's headquarters here in preparation for the company's Innovate Forum 99, held last week.

Compaq is now developing two such server appliances — one for Web caching, designed to improve the response time of Web servers, and one for file storage, Young says.

The vendor is also considering creating server appliances for tasks related to security, database management, telecommunications and messaging, he says.

The company plans to work with other IT vendors to create these server appliances. For example, the Web caching server is the result of a collaboration with Novell, Young says. Compaq will also use whichever hardware configuration and operating system platform makes most sense for each appliance, he says.

The point is to offer off-the-shelf servers that users can deploy to accomplish one specific task without having to worry about the integration of the hardware and software options, he says. "You don't have to worry about whether you need Alpha or x86 or Unix or Linux or OpenVMS or Digital Unix or NT or Novell. We'll figure out the optimal combination" for each task, Young says.

The formal launch of the new line of servers, which is aimed at enterprise customers, is slated for July, he says. Compaq started working on the concept about a year ago, he adds.

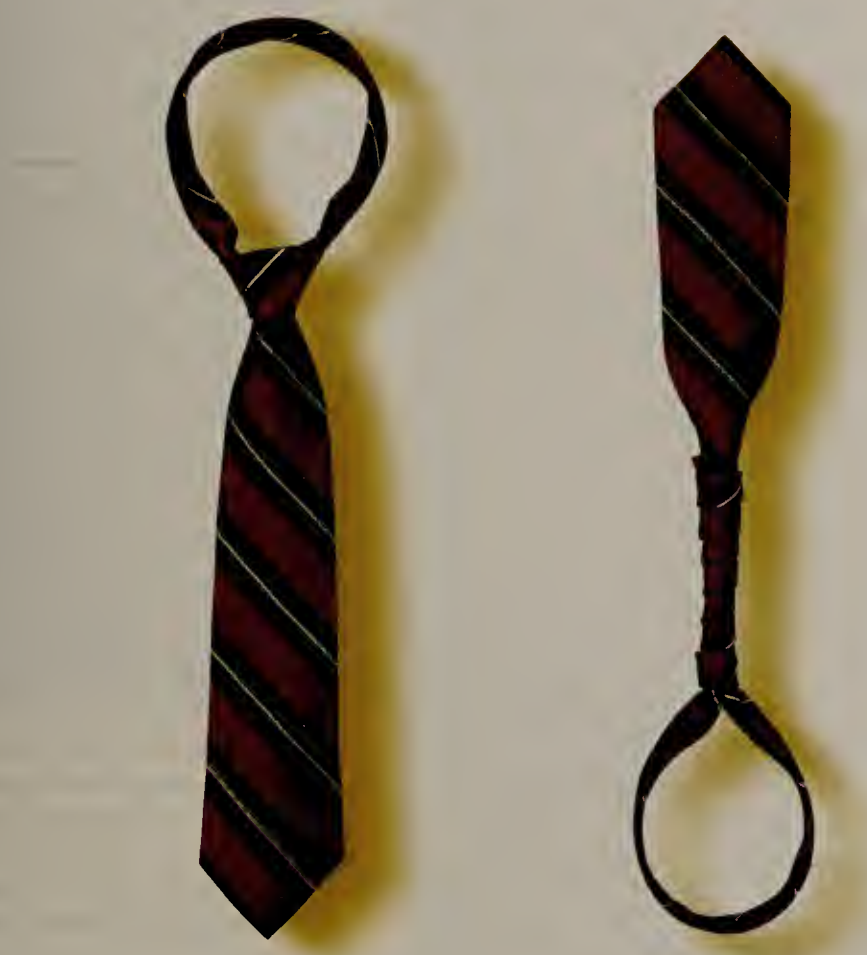
The new server appliances aren't by any means intended to erase the need for general-purpose servers. But the appliances might make life easier for Compaq customers who have seen the company's line of server offerings become increasingly complicated since Compaq acquired Digital and Tandem Computers and added their respective server families to its product portfolio.

More information is available at Compaq's Web site at www.compaq.com.

Pérez is a correspondent with IDG News Service's Latin America bureau.

HEWLETT PACKARD

If your IT Management solution fails, which thank-you gift will the boss be sending you?



The word is out. Far too many enterprise management projects don't deliver. So, what's the hang up? Recent industry analyst studies reveal that most major framework implementations take too much time and don't deliver ROI. After years of work, only a small portion of purchased functionality is actually implemented. There is a better way.

HP OpenView delivers measurable, proven results quickly and completely. A new independent head-to-head lab test* revealed "*HP delivers on the promise of integrated tools to solve specific problems... Unlike PLATINUM, CA and Tivoli, HP has not overloaded its solution with a common framework... HP's generally flawless solution sets the mark against which to measure all other out-of-the-box functionality*".

The OpenView approach is different from the "leap of faith" framework approach. Target your most pressing problem and solve it today.

HP OpenView. Reach your management goals without getting hung in the process.

HP OPENVIEW

Works | Right | Now

LEARN WHY OPENVIEW HAS SO MANY SATISFIED CUSTOMERS:

HTTP://WWW.OPENVIEW.HP.COM
OR CALL 1·800·785·3925

HP OPENVIEW OpenTECH SERIES

To Register for the OpenTech Series near you call **800-258-6236** or Visit our Website at **openview.hp.com/opentech.html**

Networld + Interop
May 11-13 Las Vegas Booth #7553

*Source: Network Computing, Syracuse University Real-World Labs®, 1999.

Internetworking Monitor . Atul Kapoor

EQUAL BANDWIDTH OPPORTUNITY FOR ALL

Some of the more interesting technologies and products shown last month at the NetEvents conference in Lake Tahoe, Calif., pertained to the core of the network infrastructure.

These technologies — terabit and wavelength routers, optical transport nodes and data-friendly dense wave division multiplexing (DWDM) — enable service providers to deploy multiservice networks in a timely and dynamic manner. Central to most of these innovations is DWDM, which uses different frequencies of the light spectrum to carry signals.

Historically, network design in service provider nets has focused on managing bandwidth as a precious resource or grafting data over a voice-optimized infrastructure. The new technologies will result in a surplus of bandwidth and equal opportunity for voice, video and data, while some new products will focus on directing the surplus bandwidth where and when it is needed.

Some NetEvents vendor offerings enable service providers to provision new services quickly and reduce time to market. Other products focus on reducing the cost of the infrastructure by eliminating compulsory SONET usage and multiplexing multiple services directly onto DWDM devices. Still others would enable service providers to offer DWDM-based metropolitan services at gigabit rates.

The technical implication of these offerings is to render moot the arguments over whether ATM should be at the core for multiservice provisioning or whether IP can be directly transported over SONET — or with DWDM if SONET is necessary at all. The new products would protect existing investments in SONET and still allow the flexibility to take any signal type — IP data, ATM cells or SONET frames — and put it over DWDM.

An interesting point of the NetEvents discussions was whether the legacy telephone companies — which still have difficulty spelling the four-letter word "data" and seem to confuse incestuous mergers and acquisitions as a sign of progress — would take advantage of these emerging technologies and become more competitive. Bill Schrader, CEO of PSINet, a leading ISP, points out yet again that it would be only a matter of time before dominant carriers would become formerly dominant carriers.

The new technologies reconfirmed the ongoing trend of technological innovation being led by start-ups. With these products, you are more likely to hear names such as Sycamore Networks, Monterey Networks, Ciena and Juniper Networks than Cisco, 3Com, Lucent and Nortel Networks. Some of the big boys claim to have innovations, but none shared future products at NetEvents.

Perhaps some of these smaller companies will become the real leaders of DWDM.

Kapoor is a senior vice president and the managing director of The Tolly Group, a strategic consulting and independent testing firm in Manasquan, N.J. Columnist Kevin Tolly will return in the May 3 issue. The Tolly Group can be reached at (732) 528-3300 or www.tolly.com.

WORLDWIDE LEADER IN SECURE ENTERPRISE NETWORKING

EXTRANET ACCESS

WHAT'S YOUR BIGGEST NETWORK SECURITY PROBLEM?

ACCESS CONTROL

With over 75,000+ installations, chances are Check Point has solved it already.

No matter what challenges you face in building a secure enterprise network, we have a full range of solutions. Real solutions. Right now. For everything from network security to traffic control and IP address management. All based on a common architecture for integrated policy management. Which means you can implement corporate policies, deploy them across your extended enterprise, and control them from a central point.

Because of our superior technology, Check Point is the worldwide market leader in both firewall and VPN implementations. And our Open Platform for Secure Enterprise Connectivity (OPSEC) is the de facto industry standard for seamless integration and management of nearly 200+ third-party security products. Which lets you choose the best solutions for your network.

Check Point solutions are backed by an experienced professional services group and 24x7 worldwide customer support. And with more than a thousand channel partners worldwide, there is a local point of contact wherever you are.

Be sure your network is secure—Check out our new white paper "Top Ten Challenges to Securing Your Network" at: **www.checkpoint.com/topten**

- Network Security
- Traffic Control
- IP Address Management
- OPSEC Alliance
- Integrated Policy Management

CHECK POINT™
Software Technologies Ltd.

If you can make it here, you can make it anywhere.

From Wall Street to Main Street, Symbol Technologies is helping businesses change the way they work.

Few business environments are more demanding than Wall Street, where multimillion-dollar transactions happen in a heartbeat, where a New York minute happens every second, and where only one wireless LAN has what it takes to make it–Spectrum24® from Symbol Technologies.

An open architecture by design, Spectrum24 is robust, scalable, and extremely reliable in demanding environments. Upon the recommendation of their systems integrator, GTE, the New York Stock Exchange chose Spectrum24 to deliver the latest application of technology which further enhances real-time order management on their trading floor. Order management that *actually will improve the way traders work* by freeing them to roam the trading floor–to buy or sell on the spot, armed with instant, accurate information needed to make split-second, market-smart executions. It's simply client service at its best.

And what Symbol does for Wall Street, it does for Main Street–dramatically increases productivity on the work floor through advanced wireless data management solutions for extremely tough environments.

For more information, contact your Symbol marketing representative.
Or call us at 1-800-722-6234 and visit us on the Web at www.symbol.com/inf.htm

Vision Without Boundaries®

symbol®

Carriers & ISPs

The Internet, Extranets, Interexchange and Local Carriers, Wireless, Regulatory Affairs

Briefs

UUNET and **Cable & Wireless** are in the process of upgrading their respective national Internet backbone networks.

MCI WorldCom's UUNET said last week at Spring Internet World '99 that the company would increase network capacity from 622M bit/sec to 2.4G bit/sec. The ISP said it is spending $1 million per day on network developments.

Cable & Wireless said it would beef up its network with 15,000 route fiber miles of fiber optics from Level 3 Communications. The company expects to have the fiber in place by 2001.

Iridium, the troubled provider of global satellite calling services, received some good news by landing a big government contract. The Defense Information Systems Agency awarded a three-year contract potentially totaling $219 million to Iridium and its principal investor, Motorola, for handsets, pagers and airtime.

Despite the contract, Iridium is still lagging behind on attracting customers and has had to get its lenders to agree to delays in meeting certain loan obligations.

U.S. carrier **Qwest** has completed its joint venture with **KPN,** the dominant Dutch carrier.

The new company, KPN-Qwest, begins with 650 employees and headquarters in the Netherlands, providing principally IP services over fully owned fiber.

The venture plans six network rings totaling 9,100 miles and connecting to 40 major cities.

Qwest contributed its European ISP called EUNet to the venture, giving KPNQwest an initial base of 84,000 customers.

ISP division to speed net integration

MCI WorldCom's Mark Spagnola outlines UUNET's future role.

NetworkWorld Q&A

Change is a way of life at MCI WorldCom. Most recently, the nation's second-largest telecommunications service provider decided to integrate its UUNET and Advanced Networks ISP divisions. This change came only one year after the carrier created the Advanced Networks division, which was to offer Web hosting and virtual private network (VPN) services. Mark Spagnola, UUNET president and CEO, spoke with Network World *Senior Editor Denise Pappalardo about the integration and what the move means for users.*

Why did the company decide to integrate MCI WorldCom Advanced Networks and UUNET?

What we saw happening over the last year was the Internet and enterprise networks coming together more quickly than both groups had anticipated.The UUNET team was looking to add more value-added features such as security for customer. And the Advanced Networks team was looking to add more core Internet access services. We felt we were confusing the customers and decided the best thing to do is to bring the divisions together.

"We felt we were confusing the customers and decided the best thing to do was to bring the divisions together."

When the company last month announced its decision to integrate the two Internet groups, MCI WorldCom said further product integration was also coming. What services will be affected and how?

Early talks have taken place, but final decisions have not yet been made.

Will UUNET still support the seven VPN services it does today?

Hopefully, not the services that do that same thing.

I don't have the product calendar in front of me, but I do know that there has been a lot of work on VPN product rationalization.

MCI WorldCom Advanced Networks was formed from CompuServe Network Services, ANS and part of UUNET. How will this merger affect network integration?

We think this will speed up some network integration, but that was happening anyway. For example, Advanced Networks was already using UUNET's dial access network. The underlying network is more and more UUNET's platform every day.

See **Spagnola**, page 32

MCI WorldCom: Pay as you go

Carrier boosts frame relay monitoring service.

BY DAVID ROHDE

JACKSON, MISS. — MCI WorldCom has turned its frame relay performance-measurement offering into a service users can pay for month-by-month.

The carrier last week introduced MCI WorldCom Circuit View, a service that employs intelligent DSU/CSUs at each frame relay customer site to capture and analyze packet throughput, delay and loss across the WAN.

Circuit View uses hardware and software from Visual Networks, a Rockville, Md., provider of WAN performance-measurement tools. With the service, Visual Networks' Analysis Service Element (ASE) — the intelligent CSU — feeds information about each site's packet throughput to a shared server at an MCI operations center. The server, called the Performance Archive Manager (PAM), generates up to 60 reports on network performance.

By dialing in to the server over the frame relay net, corporate network administrators can check MCI network performance against their service-level agreements. They can also examine whether their networks are over- or underutilized, view the comparative performance of traffic according to Layer 3 protocols and check historical information on their frame relay nets.

MCI last year began offering the Visual Networks system, including ASE boxes and a dedicated PAM server installed either at MCI or a customer's site (*NW,* Jan. 19, 1998, page 23). But that

See **MCI WorldCom**, page 32

Measuring what you're paying for

Monthly prices for MCI WorldCom's new frame relay performance-measurement options:

	Circuit View	Circuit View Plus*
1-year contract:	$38 per site	$68 per site
2-year contract:	$26 per site	$56 per site
3-year contract:	$22 per site	$52 per site

* Circuit View Plus includes engineering and report generation assistance from MCI network operations staff.

All prices are in addition to frame relay port and circuit charges.

Spagnola,
continued from page 31

This isn't a result of merging the two organizations, but it has been accelerated.

Are the networks interconnected?

The networks already interoperate, but the issue is how to scale customer demands. For instance, if a customer needs a 100-site VPN set up there is a lot more bandwidth on the UUNET backbone than there is on the old CompuServe backbone. So some existing customers may be ported over to UUNET's underlying infrastructure to better support their demands, but these changes hopefully should be invisible to customers.

Are the billing systems integrated?

No. This is our chief information officer's responsibility, and he will begin looking at that. We will continue to run [MCI WorldCom Advanced Networks'] systems and processes in the near term. We will look at, real quickly, back-office technology that would integrate systems, but there is not a specific plan to do that.

Why is merging UUNET and MCI WorldCom Advanced Networks a positive move for customers?

For UUNET customers, it lets them have access to more complex stuff. Let's say they want to do more than just IP access, such as integrating multiple systems onto a VPN, it will now be just a natural upgrade. For legacy Advanced Networks customers, although they always had it, they will have more direct access to UUNET's Internet access bandwidth. Maintaining two ISP divisions was too confusing from a sales and marketing standpoint. Now customers have one sales team to deal with for all IP services.

Have all the sales folks been trained on the various services?

In some cases the answer is yes, but not in every case. The sales team will be cross-trained as new products roll out. And as we roll out remote access products, for example, everyone who sells remote offerings will be trained. ◪

MCI WorldCom,
continued from page 31

offer was limited to managed frame relay customers and required up-front payment for the network devices. Although MCI did not release prices at the time, ASE boxes generally cost more than $1,000 each and the PAM server costs upward of $20,000.

By contrast, Circuit View is available to all MCI frame relay customers at $38 per site, per month or less, depending on the contract (see graphic, page 31). That price is added to the user's frame relay port and permanent virtual circuit charges. The ASE feeds data to the remote server at the MCI operations center over a separate management PVC included as part of the Circuit View price, explains product manager Rebecca Lewis.

AT&T already has a pay-as-you-go option called Frame Relay Plus, introduced nearly a year ago and also based on Visual Networks gear. The AT&T offering includes a number of service options with various prices and report privileges.

By contrast, MCI WorldCom officials say they hope their flat per-month price structure is simpler and will induce more users to buy. Officials promise that all available reports will be available to all Circuit View users. ◪

Size does matter!

(128 fully-routed Gigabit Ethernet ports in a Single Chassis.)

NEO
NETWORKS™

Find out more about NEO Networks and our award-winning StreamProcessor™ gigabit switch routers.
Stop by our booth at the Networld+Interop trade show, visit us on the web at **www.neonetworks.com** or call us toll-free at 888-NEO-MPLS.

Free Product info enter NWInfoXpress #34 online @ **www.networkworld.com/infoxpress**

Eye on the carriers . David Rohde

A GAME OF TELECOM CHICKEN

The big long-distance carriers, the Federal Communications Commission and the federal courts are playing a three-way game of chicken over how telecom rates are regulated.

You can argue that rates for long-distance voice and data services don't need to be regulated anymore. On voice rates, the FCC has a successful process in place to reduce per-minute termination charges by regional Bell operating companies every year, and that has helped to bring corporate telephony rates way down. On data, RBOCs and new carriers such as Qwest, once they get in the long-distance market, should do more than any mandate to bring down still-sticky frame relay and other service prices.

And on both types of services, the threat of losing customers to Internet and other IP service providers will potentially cause carriers to lower prices rather than lose business.

Yet carriers still file thousands of pages of tariffs with the FCC that agency officials openly admit nobody reads. Why? Not because the FCC wants them to — in 1996 the agency tried to order them to stop doing so — but because the carriers got a federal court to keep the tariff process alive.

Carriers like tariffs because on one day's notice they can file a price increase with the FCC that overrides a firm contract you may have for a particular negotiated rate. That's what a tariff is — not just a price sheet but a legal document that actually overrides private contracts.

The FCC thinks this is dumb. So last month the agency tried a new tactic to end tariff games. The FCC passed a regulation saying large long-distance carriers must post their rates on their Web sites. Don't worry — the regulation doesn't say carriers must disclose your company's rates. It's just a reference guide of regular rates. And the regulation says the online postings aren't tariffs. They're just consumer information.

With this ruling, the FCC hopes to demonstrate that tariffs don't need to remain alive just to retain some public information about rates. The FCC is hoping that the U.S. District Court in Washington, D.C. — which is holding up the order to end tariffs with a stay — will be moved by this action to remove the stay.

Then we'd end up with basic, nonbinding price sheets on the Web but no tariffs that can be altered at the drop of a hat. That would seem to represent a sort of ideal capitalistic system of bountiful information for the masses and leave latitude to negotiate by individuals.

Actually, the situation could be comical. Carriers' basic telephony rates, which no real enterprise net executives pay, are absurd. AT&T still charges 28 cents per minute for daytime calls for people who aren't on a rate plan. Even its basic, nondiscounted rates for business telephony services are often in the teens and twenties. MCI WorldCom and Sprint have similarly distorted rate structures.

Those would look silly posted online at a time when national carriers are promoting 5-cent Sundays and 10 cents around the clock. But if this new disclosure scheme forces the long-distance carriers to improve their rates for Aunt Sally in Kalamazoo who never called to change her carrier, so much the better!

Rohde is a senior editor with Network World. *He can be reached at drohde@nww.com.*

It's not just Size...

Performance counts, too.

(400 Million packets/second in a Single Chassis.)

NEO
NETWORKS™

Find out more about NEO Networks and our award-winning StreamProcessor™ gigabit switch routers.
Stop by our booth at the Networld+Interop trade show, visit us on the web at **www.neonetworks.com** or call us toll-free at 888-NEO-MPLS.

Free Product info enter NWInfoXpress #34 online @ **www.networkworld.com/infoxpress**

Cisco's voice plans lead to telephony throne

BY JIM DUFFY

PACKET TELEPHONY

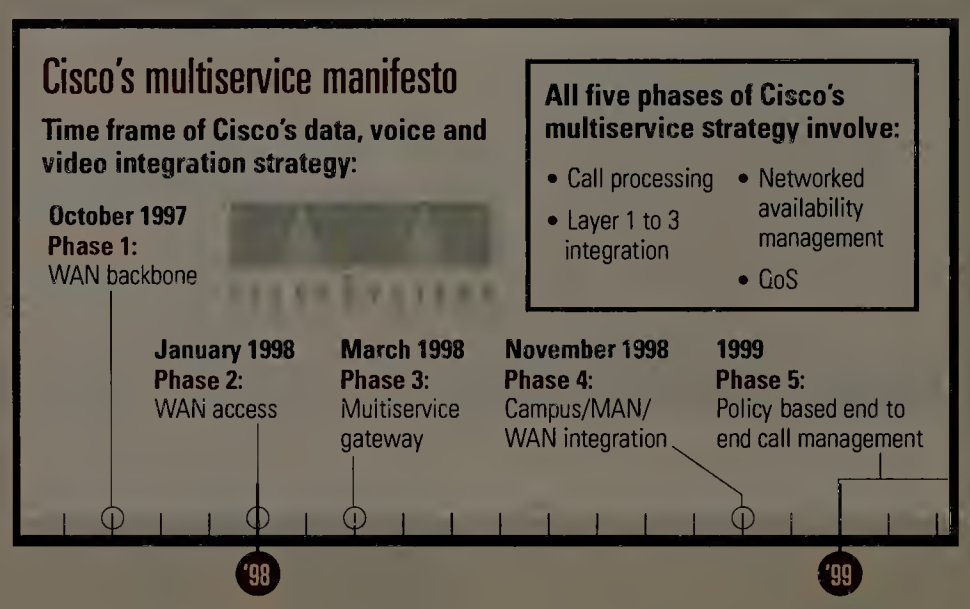
Cisco's line of integrated voice/data devices aims to make circuit switches and PBXs obsolete.

If Cisco has its way, users will have already bought their last PBXs. They will have begun migrating call processing to LAN servers, routers and switches, running voice over their data networks as if it were just another packet. Indeed, Cisco plans to be a PBX-free enterprise within 18 to 24 months.

Cisco, king of the data network, is moving aggressively into the voice world in an attempt to become king of telephony.

As the Internet becomes a commonplace service infrastructure or utility — like water, electricity and, yes, telephones — Cisco is leading the charge into the new world of packet telephony.

"Circuit switches and PBXs are dinosaurs of the past," said Cisco President and CEO John Chambers earlier this year at ComNet '99. "If you're building out your circuit-switching infrastructure and not writing it off, you're putting your company at a major disadvantage."



Strategic acquisitions

Cisco is building its entire line of small office/home office, remote access, branch office and mid-range and high-end routers with voice capabilities. Call processing and voice quality-of-service (QoS) enhancements are on tap for its LAN switches. And Cisco made what is arguably its most strategic acquisition since the 1996 purchase of StrataCom: last week's $2 billion deal for GeoTel, a developer of Internet-based customer service call-routing software.

GeoTel software integrates enterprise data applications with voice devices such as PBXs to deliver integrated data and voice to call centers over the Internet and the public switched telephone network. The software routes a customer to an available customer service representative independent of physical location, Cisco says.

GeoTel products will enable Cisco to offer its partners and customers a software platform to develop Internet voice applications, Cisco says.

Another key Cisco voice acquisition was last October's purchase of Selsius Systems, a maker of packet-switched PBXs.

Selsius' Network PBX, call management software and IP telephones, combined with Cisco's voice-enabled network products, lets Cisco offer an alternative to a traditional PBX. IP telephones connected to LANs provide PBX functions at a lower cost on a more scalable, distributed and open architecture, Cisco says.

Cisco emphasizes that the products are a PBX alternative, not a replacement.

"No one is ripping out their 20,000-seat PBX to replace it with voice over IP," says Byron Henderson, director of marketing for Cisco's enterprise line of business. "And we're not recommending that. Now is the time for small sites and small enterprises to be trying this stuff out and begin the migration."

Five-phase plan

Cisco's telephony products and acquisitions are the underpinnings of a methodical five-phase strategy for converging voice and data networks in the WAN and campus (see graphic). Cisco's goal, and the fifth phase of its multiservice initiative, is to create an open architecture for intranet and Internet telephony that can perform end-to-end, policy-based call management.

Early returns look promising. Cisco claims to have shipped more than 300,000 packet telephony ports in the first half of its 1999 fiscal year.

But Cisco will have plenty of competition and a raft of new challenges as it ventures off into the voice world.

There are the well-entrenched incumbents — Nortel Networks, Ericsson, Lucent, Alcatel and Siemens, the NELAS, as Cisco refers to them — with which it will now compete. The NELAS have been building global circuit-switched voice infrastructures for decades, each earning a reputation for bulletproof reliability and continuous service availability.

So Cisco will have to persuade carriers and service providers that have been doing business with the NELAS for 20-plus years that they should now be banking their profit centers on Cisco. That's a major challenge.

Incumbent on that challenge is another — reliability. Cisco has to prove it can match or better the NELAS at providing global voice infrastructures that are always up and always available, providing a dial tone that is always there when people pick up the phone.

Cisco and its service provider customers cannot afford another outage like the one a year ago involving AT&T's frame relay service and a Cisco switch.

Cisco acknowledges that packet telephony is still an immature technology.

"People are running stuff in parallel and will for a time until they believe it's as robust and as solid as their voice network," says Ian Pennell, director of marketing for Cisco's multiservice access business unit. "But people are not waiting for everything to be perfect before they start their transitions."

Users cautious

In addition to service availability, service quality will be another challenge for Cisco. Data networks drop data packets, but that just cannot happen with voice.

For service quality and reliability reasons, Cisco users are weighing packet telephony cautiously.

"To completely replace our voice infrastructure statewide, I don't know that we're there yet," says Jimmy Webster, network manager for IT services at the state of Mississippi.

"We've got pretty good contracts for long distance with our carrier and because of that, packet telephony doesn't make sense in some locations until the technology's a little more mature. That's not a slight toward Cisco, it's a slight toward the technology," he says.

Nonetheless, Mississippi sees a potential benefit to voice over IP as a replacement for PBX-to-PBX connections and remote phone-to-PBX connections from county offices to the state capital in Jackson.

Tutor Time, a child care and learning center business in West Palm Beach, Fla., is "sacrificing a little QoS for the utility and the cost savings involved" in running voice over frame relay, says Todd Dion, vice president of technology.

"But of all the technologies I use to justify the network, it was really voice that was a key to be able to sell it to my board of directors," he says.

"QoS is not as full duplex as circuit-switched voice, but it's acceptable," Dion says. ◪

Performance up to Expectations?

(Real-time RMON on all 128 Gigabit Ethernet ports in a Single Chassis.)

NEO NETWORKS™

Find out more about NEO Networks and our award-winning StreamProcessor™ gigabit switch routers.
Stop by our booth at the Networld+Interop trade show, visit us on the web at **www.neonetworks.com** or call us toll-free at 888-NEO-MPLS.

Free Product info enter NWInfoXpress #34 online @ **www.networkworld.com/infoxpress**


Global satellite communications
from COMSAT.
Because maybe one day you
actually will have an office on the moon.
And when you do, we'll be ready to handle your communications. All of it. Data, voice, video,
and Internet. Because at COMSAT, we're in the business of anticipating customer needs.
COMSAT
Delivering the Future.℠
+1 301 214 3100 www.comsat.com
Free Product info enter NWInfoXpress #30 online @ www.networkworld.com/infoxpress

Briefs

Sybari Software of East Northport, N.Y., now supports Lotus Domino Server 5.0 with its Antigen 3.15 antivirus product, which began shipping April 1. Antigen provides real-time mail stream and database virus protection. It costs $4,995 for a two-year, 250-user license.

Sybari: (800) 239-1095

Compuware will announce at this week's Windows World that its EcoTools software will manage Windows 2000 applications — when they ship. The company is working with Microsoft to give EcoTools access to information about application performance. For instance, EcoTools will be able to measure the time it takes to transfer application data between servers.

The software is available now, starting at $695 per managed server.

Compuware: (800) 521-9353

Hewlett-Packard recently announced OpenView ManageX Version 4.1, a new version of its Windows NT application management software that manages Novell NetWare 5.0 servers.

The software is shipping now for $795 per server.

HP: (650) 857-1501

Lantronix is adding Sun's Jini technology to its line of print servers and later to its thin-server product line, which connects industrial controls, blood analyzers and other devices to corporate networks. Jini, with Sun's Embedded Java, will act as a kind of universal driver. Any client device with Jini code, from a PC to a digital camera, will be able to find and work with legacy printers and equipment attached to the Lantronix servers. No release date has been set.

Lantronix: (949) 453-3990

NDS 8.0: Over one billion objects served

BY ROBIN SCHREIER HOHMAN

Beta testers trying out Novell Directory Services (NDS) Version 8.0 have stumbled upon an unintended game: Stuff the Directory Tree.

Several early users are putting the next version of NDS through the usual paces — compatibility, ease of installation and functionality — but users seem most intrigued by its ability to support up to one billion objects. An object is virtually anything in a network, including computers, routers, programs, files and people. Because the NDS database structure is hierarchical, it is represented by a directory tree to show categories and subcategories within that structure.

Gary J. Porter, a systems programmer at the University of Kentucky, is busy trying to find NDS 8.0's limit. "I'd like to find out where it will break, but my meager resources won't stretch to find its bounds," he says.

It's more than just a game, however. For MpoweredPC, a division of Maritime Telegraph and Telephone in Halifax, Nova Scotia, it's a business proposition. The telco is building a digital subscriber line network to support LAN services sold to businesses and home users. The division's plan is to sell the network and software on demand.

That kind of business is an administrative nightmare, and MpoweredPC's chief technology officer is counting on NDS to help him. "Our initial estimates were that we needed about 100 million objects in the directory [to support on-demand service]," Monty Sharma says. "We were wrong," he says with a laugh, pointing out that revised estimates peg his needs at closer to 30 billion objects.

Sharma says he's been able to load NDS with more than one billion objects, and he hasn't seen a performance hit. He's pressuring Novell to give him a ceiling, but he says so far the company says it hasn't reached a limit either.

Sharma's not unrealistic, though. Even if he has to run 20 trees, he'll be satisfied.

Peter Cruikshank, network supervisor at the space-enabled warfare systems command for the U.S. Navy, doesn't need that many objects to centrally administer his network. "Being the Navy, one million's not beyond our capability," he says, pointing out that figure is more than previous versions of NDS allowed. Cruikshank's goal is to create a single point of administration, including his Windows NT and Sun Solaris machines. He is also looking forward to integrating with Lightweight Directory Access Protocol-enabled directories for synchronization.

At the University of Kentucky, Porter had to do a lot of planning to allow 22,000 students to log on to the network from 18 points around campus. Now, administration is almost easy. "Hire a new systems administrator, send him/her to a one-day seminar, and you have an NDS expert," he says. "That should make me worry."

Porter also likes the backward compatibility of NDS 8.0. "Because they kept the upper structure similar to that before, the programming API set did not change," he says. Therefore, code written for NDS 7.0 will work with NDS 8.0.

MpoweredPC's Sharma says Novell has met everyone's expectations for the next few years. But Novell still has work to do if it wants to beat Microsoft's Active Directory when it's released; Microsoft has marketing muscle about which Novell could only dream.

One way to beat Microsoft is to get more software vendors to write applications that take advantage of NDS. ◪

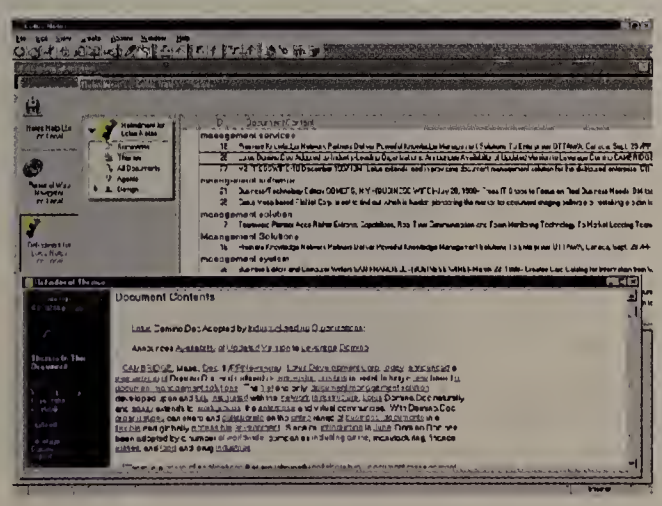
NDS Version 8.0

The new version of Novell Directory Services is far more scalable than previous versions, with support for:

- Lightweight Directory Access Protocol Version 3.0.
- One billion objects per tree.
- Millions of objects per container.

QUICKTAKE

Refindment for Lotus Notes



Large enterprise users now have a way to search and organize data in Notes databases with the release of Refindment for Lotus Notes from Multicosm.

Refindment adds a layer of links to documents held in Notes databases, allowing users to find related items more easily. It stores links in a separate master database that is accessible through the Notes desktop or the Notes/Action menu.

Refindment sorts information based on concepts found in the document index. Entire databases can also be categorized by content, letting users drill down through themes to find the documents they need. Links can be dynamically added to individual documents.

With Refindment, users will still need access permission to see full documents. Security is maintained through Notes logon and permission administration.

Refindment requires Lotus Notes/Domino 4.6. Pricing starts at $75 per seat for 10 seats, and drops when more users are added.

Multicosm: (415) 896-2334

PeerLogic expands middleware line

Company plans to use three-product arsenal to build global directory.

BY JOHN COX

PeerLogic recently added a directory and an Object Request Broker (ORB) to its middleware arsenal.

The company, which currently markets a message-oricnted middleware product, bought the i500 directory and the Dias ORB from ICL, Ltd., the British IT services giant.

PeerLogic will eventually redesign the three tools so they can work together.

PROFILE: PEERLOGIC, INC.

Headquarters:	San Francisco
Founded:	1986
Primary business:	Middleware products that link together large scale enterprise applications.
CEO:	Dan Gregerson
Employees:	Approximately 90
Web site:	www.peerlogic.com

PeerLogic's Pipes Platform middleware lets server applications share data via messages. As an ORB, Dias lets reusable software components interact over a network.

The i500 directory is one of the few large-scale products based on the X.500 standard for global directories. Other vendors, such as Microsoft and Novell, offer directories based on the Lightweight Directory Access Protocol (LDAP), which the PeerLogic product also supports.

Ultimately, PeerLogic's plan would allow objects to find each other on corporate networks via the i500 global directory. The objects could then interact with each other and legacy systems via the ORB and messaging software.

For now, PeerLogic will sell all three as separate products.

Analysts see a need for global directories such as i500.

"LDAP directories tend to be single directories," says Ann Thomas, senior consultant with Patricia Seybold Group, a technology research company in Boston.

"X.500 directories have a much stronger distributed architecture. If customers are trying to create an integration strategy for their enterprise applications, they need to federate multiple directories. That's where they're using the X.500 model," she says.

Besides creating federated, or meta, directories, companies also will be turning to directories to store information about digital certificates used in securing electronic commerce applications, says Alastair Quinn, senior vice president for PeerLogic's U.K. operations.

PeerLogic has a strong middleware offering, Thomas says. But the company has formidable rivals for each of its three products. Competitors include Imprise, Iona Technologies, BEA Systems and IBM.

What PeerLogic is still missing, Thomas says, is a "message broker" — software that identifies a new network event, such as receipt of an order, and then passes data from that event to other enterprise applications so they can act.

PeerLogic officials say at least one more acquisition is planned, but they declined to release specifics.

PeerLogic: (415) 626-4545

Consulting firm adds XML application server to open source movement

BY ROBIN SCHREIER HOHMAN

SANTA CRUZ, CALIF. — Lutris Technologies, a little-known California consulting firm, hopes to make a name for itself by releasing a Java/Extensible Markup Language (XML) application server to the open source community.

> ***"There are a lot of people who have seen the success of Linux and are trying to take advantage of all those developers out there."***
>
> Dan Kusnetsky, analyst, International Data Corp.

The company has already piqued some interest, and several thousand people have downloaded the Enhydra software from the Lutris Web site.

Whether that interest will turn into a movement, with programmers working on the development just for fun, remains to be seen. If enough folks become fans, more and more users will rely upon Lutris for consulting services, the company hopes.

Enhydra is a Java/XML application server and development framework used for building dynamic, multitier Internet applications.

It can dynamically process information from multiple sources, including stored XML. This helps it tie together back office and database applications, a function that is essential for posting electronic commerce Web sites.

Enhydra is written in Java and builds upon the servlet interfaces that are standard extensions to Java, according to Michael Browder, vice president of engineering at Lutris.

Enhydra also includes an XML compiler, which compiles XML as defined by a particular Document Type Definition and then churns out a set of Java classes.

Those classes can be included in a servlet or in a standard Java client program.

The servlet or Java client program become objects that can be manipulated to dynamically build an Internet application.

Enhydra doesn't store XML by breaking it down into an object database the way that Bluestone Software's XML Server does. Rather, it dynamically creates XML for use in a Web page or e-commerce application.

Lutris maintains a Web page at www.enhydra.org. Enhydra is fully open source; that is, developers can download the source code, change it, and include it in their own applications, all free of charge.

Still, all this does not a movement make.

"There are a lot of people who have seen the success of Linux and are trying to take advantage of all those developers out there," says Dan Kusnetsky, an analyst at International Data Corp. in Framingham, Mass., who follows Linux.

He cautions, however: "They haven't figured out that those developers have to be interested in it."

Lutris may be on the right track. Enhydra compares favorably to other Internet application servers on price alone: IBM's WebSphere costs $6,000 per CPU and Netscape's Application server comes in at $35,000 per CPU, according to Lutris.

And Lutris has got some credibility in the open source movement, considering the fact that David Young, who wrote *The Visual Tcl Handbook,* is the company's vice president of corporate development.

Tcl was one of the early open source programming languages and is still commonly used. ◪

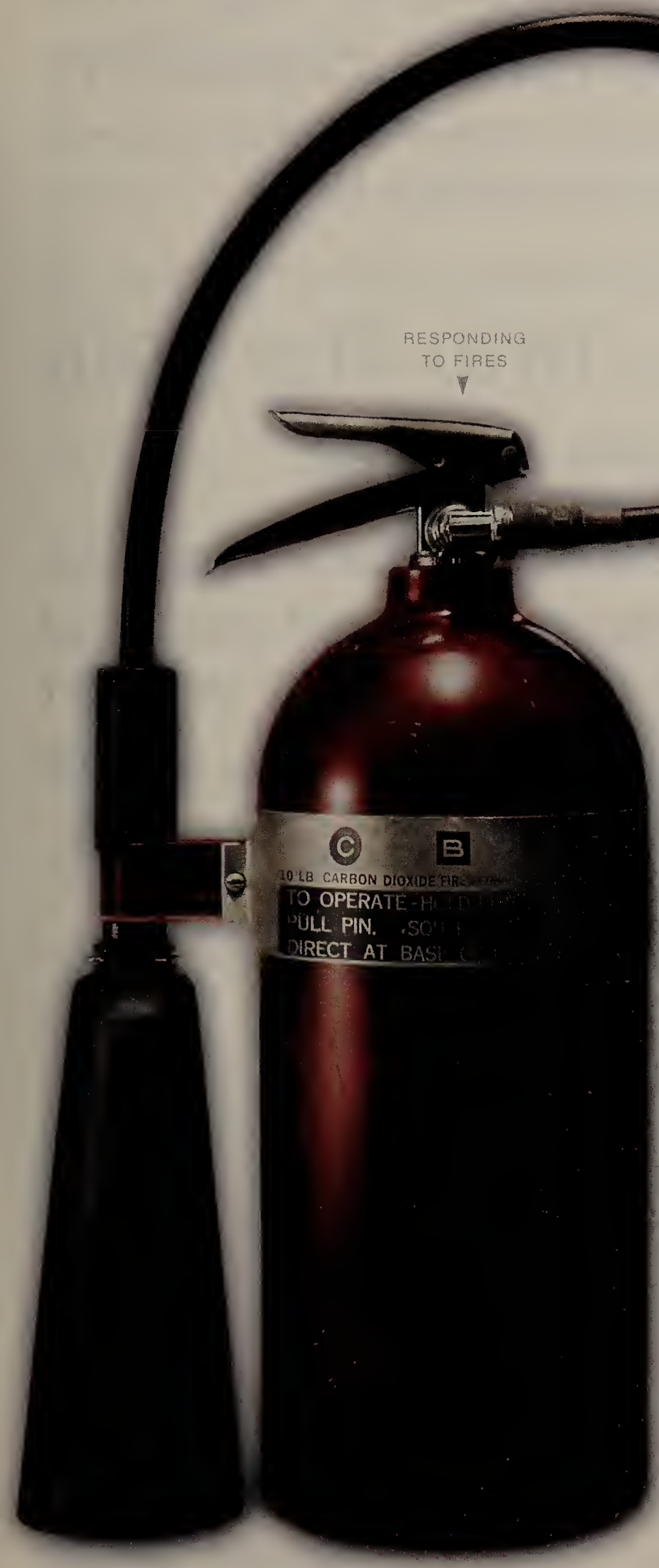
Open source application server

California consulting firm Lutris Technologies is trying to make its mark with Enhydra, an open source application server the company developed and is maintaining at www.enhydra.org.

The names Enhydra and Lutris come from the Latin nomenclature for the sea otter, *enhydra lutris.*

Lutris runs a mailing list and maintains an archive for tech nical discussions about Enhydra.

PROACTIVE SERVER HEALTH MONITORING



VS.

KEEPING
YOUR COOL

Why run around putting out fires, when you can pre-empt them altogether from your desk? (Or *anywhere* via the web.) Seagate Manage Exec proactively monitors, analyzes, and reports on Windows NT and Novell NetWare systems' health, alerting you to problems before users are impacted.

1 - 8 0 0 - 7 2 9 - 7 8 9 4 e x t . 8 2 4 1 5

w w w . s e a g a t e s o f t w a r e . c o m

Seagate Software
Information, the way you want it.

“

SQL Server takes a big step toward enterprise capability and introduces dramatic ease-of-use improvements with version 7.0 of the database server.” *–PC Week*[1]

“New features extend SQL Server’s performance and scalability...most of the changes will move SQL Server from the role of department server into the role of enterprise database server.” *–Windows NT*[2]

“SQL Server 7.0 boasts impressive features that administrators and users will both appreciate.” *–InfoWorld*[3]

“SQL Server 7.0 provides the flexibility, relational power, and continued ease of use that should put the product in the corporate winner’s circle.” *–Intelligent Enterprise*[4]

“We recommend that you consider SQL Server 7.0 for new data warehousing projects ranging from departmental and line-of-business data warehousing even to the enterprise, especially if you’re already a [Windows] NT shop.” *– Mitch Kramer. Patricia Seybold Group*

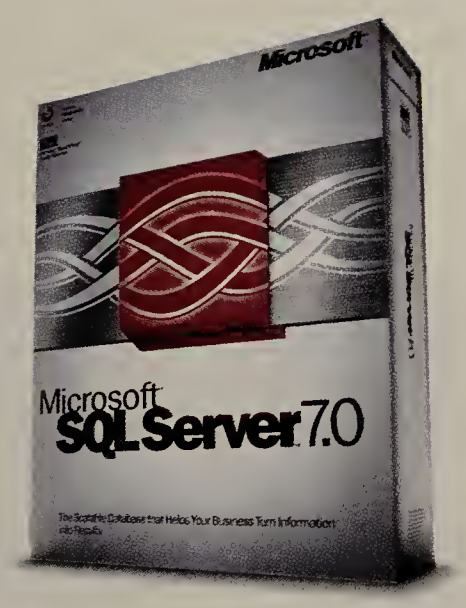
PC Week Best of Show, *COMDEX/Fall 1998*

Database and Server Software 1998 Product of the Year *–InfoWorld*[5]

”

Microsoft

Where do you want to go today?®



It's great that critics think it's enterprise ready, but it's more important that we convince you. We invite you to find out more about Microsoft® SQL Server™ 7.0 at www.microsoft.com/sql

'Net Insider . Scott Bradner

A SELF-ANOINTED PRIESTHOOD

Once upon a time, ordinary people could not read. Not only were they not taught how to read, it seemed somewhat suspicious if they learned on their own. Wise men and priests did the reading and passed down their wisdom to the hoi polloi.

This sort of separation seemed to have been abolished, at least officially. But now it seems as if Texas is trying to bring it back.

Earlier this year, Texas Judge Barefoot Sanders prohibited software company Parsons Technology from distributing Quicken Family Lawyer and Quicken Family Lawyer 99. The judge ruled that the self-help software violated the Texas statute barring unauthorized practice of the law.

At first glance, this might seem to be just a bit of excessive zeal or income protection by the six lawyers on the Texas Unauthorized Practice of the Law Committee who argued the case before the court. But the implications are ugly indeed. Carried to an illogical extreme, libraries would have to restrict access to law books and case histories on the off chance that a nonlawyer might read them and learn something.

Just when the Internet is becoming an ever-more-useful source of information on all sorts of topics, including the law, decisions such as the one in Texas muddy the waters and raise considerable fear, uncertainty and doubt in the minds of companies that would like to provide services over the 'Net. If software can be declared an illegal ersatz lawyer, what risk does a medical information database provider run?

The issue is made more difficult by the widespread presence of junk information, ranging from baseless theories of self-trained and self-identified "experts" to outright fraud. In the past few weeks, there has been a spate of stories about sudden dramatic movements in various stock prices. In many cases, the cause of the movement has been an anonymous report in some online chat room. In one case, reports pointed to a fake Web page that looked like one from a respected Wall Street financial analysis firm.

There is a great temptation to create more-complicated laws to try to deal with such situations. But as shown by the Texas case, one can apply (or misapply) current laws to most of the problem situations.

We will see many more cases such as the one in Texas, in which an entrenched group tries to use the law to protect its income. We will see all too many cases in which new laws will be crafted to counter some specific perceived online problem. What I do not expect to see enough of are new laws to protect the general Internet user against the entrenched special interests. For example, it hardly benefits society when lawyers try to keep people from understanding the law.

Disclaimer: Harvard trains lawyers, but please don't hold that against us. In any case, the above are my own observations.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@harvard.edu.

Technology Update

An Inside Look at the Technologies and Standards Shaping Your Network

Ask Dr. Intranet

By Steve Blass

I am trying to set up my company's LAN to route through the domain server so users can connect to the ISP that stores our mail. I've installed and configured Microsoft Proxy Server 2.0 so users can browse the Internet and so NT domain-valid users can connect to the server's shared partitions. But when users try to connect from Windows NT and 95 to their Internet mail through Outlook 97, they get a message that they can't connect to the mail host.

Via the Internet

Make sure you've configured the proxy server to let mail traffic pass. You can change the security settings as follows:

Select "Security" on the "Service" tab.

Check "Enable packet filtering on external interface."

Check "Enable dynamic packet filtering of Microsoft Proxy server packets."

Check "Enable filtering of IP fragments."

Edit the exceptions. You can accept the default ICMP exceptions and add the following.

- For Direction: Both, Both, Both, Both
- For Protocol: TCP, UDP, TCP, TCP
- For Local Port: Any, Any, Any, Any
- For Remote Port: DNS, DNS, POP3, SMTP
- For Local Address: Default, Default, Default, Default
- For Remote Address: Any, Any, Any, Any

Restart the machine, and the mail should go through.

As a network architect at Sprint Paranet in Houston, Blass understands the strain of developing and managing intranets. Send your problems to dr.intranet@paranet.com.

IP backbones get high-speed boost

BY GEOFF NELSON

Wire-speed Layer 3 switch-routing has evolved from an enterprise network technology to being used in core public data networks. Largely due to that switched and routed traffic, a new technology — Packet Over SONET (POS) — is emerging as a strong contender for connecting high-speed backbone routers.

POS technology is already being implemented in the hardware line cards of gigabit and terabit routers. With wire speeds ranging from 155M bit/sec to 2.4G bit/sec, POS promises IP backbone speeds of up to 10G bit/sec, all without using ATM.

POS eliminates the ATM middleman by mapping IP packets directly onto SONET frames. This move eliminates ATM's step of segmenting variable-length IP packets into short fixed-length cells prior to SONET transmission. POS also allows the IP-switching capabilities of new routers to be combined with the transmission-management capabilities of SONET add-drop multiplexers for increased network efficiency and throughput.

POS performs a link-layer (Layer 2) function similar to Gigabit Ethernet. POS looks after the transmission media and lets the router do its job of routing IP packets. While Ethernet is suited to the types of cabling found in LAN environments, the SONET side of POS provides the transmission-management features, such as fault management and protection switching, required in large carrier or enterprise fiber networks.

POS offers several advantages over the alternative, packet over ATM, which adds an ATM switch between the IP router and the SONET multiplexer. While ATM was designed to provide fine-grained multiplexing of data, voice and video services, most network traffic today is IP and most desktop multimedia applications use IP rather than ATM as their native protocols (for example, using the H.323/4 audio and videoconferencing standards).

POS is designed specifically for high-speed, high-volume IP packet traffic transmission and uses the latest IP traffic management features implemented in many next-generation routers.

This design includes ATM-like features, such as differentiated classes of service (COS) and quality-of-service (QoS) management. To ensure IP QoS levels, for example, it's possible to specify paths for IP packets to follow using Multi-protocol Label Switching.

This connection-oriented behavior is similar to the way ATM operates. Unlike ATM, however, IP COS protocols used by POS are optimized for variable-length packets rather than fixed-length ATM cells. POS enables IP traffic management capabilities to be overlaid directly on a SONET transmission network, without the so-called "cell tax" imposed by ATM's overhead and management bandwidth requirements.

Carriers such as Sprint and Qwest, and ISPs such as UUNET are already starting to introduce POS equipment into their network architectures. In addition to bandwidth efficiency, POS will let carriers and ISPs introduce IP differentiated and tariffed services for two or three different COSes over their existing SONET infrastructures.

Gigabit Ethernet seems to meet many of today's speed requirements at a lower per-port price. However, POS offers additional advantages, such as better scalability and the flexibility to be deployed over simple point-to-point links or SONET-ring topologies with protection switching. These advantages may increase POSes' attractiveness down the road for large-scale enterprise network operators.

POS can also operate as a high-speed WAN technology over OC-3 leased lines, making it an alternative for point-to-point enterprise applications such as corporate intranets. For router manufacturers, POS has gained rapid acceptance by providing a quick, clean way to migrate routers from traditional LANs to carrier environments.

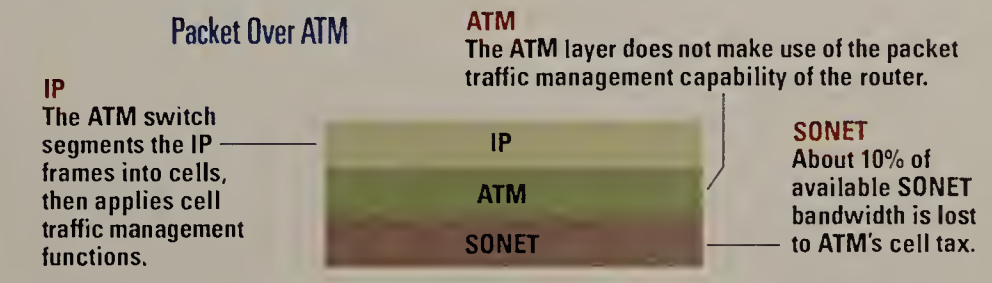
Most of today's POS products are based on a combination of two IETF recommendations: RFC1619 (PPP over SONET/SDH) and RFC1662 (PPP in High-Level Data Link Control-like framing). PPP is a simple link management protocol that establishes the IP-over-SONET connection. The IETF's PPP Extension Working Group this month has submitted a draft POS standard for approval that will replace RFC1619.

Nelson is a broadband test specialist for Hewlett-Packard Advanced Networks Division in Australia. He can be reached at geoff_nelson@aus.hp.com.

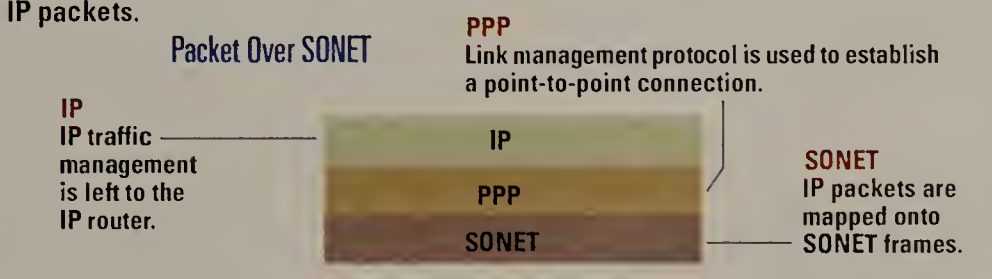
UP CLOSE

Comparing Packet Over SONET (POS) and ATM

ATM's designers intended the technology to become the universal way to handle end-to-end voice, data and video. The problem with ATM in the WAN has been the 5-byte overhead "cell tax" on every 48-byte ATM cell, which adds up to almost 60M bit/sec of wasted bandwidth on each OC-12 (622M bit/sec) link.



POS is aimed at building IP backbones. POS performs a Layer 2 function similar to Gigabit Ethernet: It looks after the transmission media and lets the router route IP packets.



Gearhead — inside the network machine . Mark Gibbs

DYNAMITE DYNAMISM

A few weeks ago, "Gearhead" discussed JavaScript and followed that with a discussion of HTML, JavaScript and bookmarklets.

From your letters I get the impression it went well, so this week I thought "Gearhead" would discuss a question posed by a reader after the JavaScript column: "Where does Dynamic HTML fit in?"

While JavaScript can create content in an HTML document, it can also interact with document contents. Combine that ability with content formatting control and you can make Web documents with amazingly sophisticated behavior, what Dynamic HTML is all about.

For example, you can make toolbars on Web pages that stay at the top of a window so the toolbars are always visible even when the page is scrolled down. See the section on drifting toolbars on Netscape's DevEdge Online at http://developer.netscape.com/tech/dynhtml/index.html for an example that works with Version 4.0+ of Netscape Navigator and Microsoft Internet Explorer.

At the heart of Dynamic HTML is something called the Document Object Model (DOM) — as if we needed yet another acronym identical to those for Distributed Object Manager, Data Output Message and Document Object Management.

The DOM is (and here's a string of $5 words) "a hierarchical structuring of the contents of an HTML document." What this means is that the HTML elements that comprise a document (links, anchors, images and plug-ins) are arranged in a tree and referred to generically as "objects."

The DOM tree starts from the window in which the document is displayed and includes its location, frames, events that occur and even the history of the window (the URLs that have been displayed in that window). Events in the model include loading and unloading the document, and when the mouse interacts with an object by moving across or away from it, or clicking on it. And to make life even easier, under the 4.0+ browsers, objects can also be named.

The importance of this structure is that it gives a consistent way of referring to objects within a document. Want to access the third form in a document? Under the DOM, that object would be referred to as document.form(2) (the numbering of objects of a specific type starts at zero).

But there's more to it than just scripting. Dynamic HTML is three technologies combined: HTML, Cascading Style Sheets (CSS) and scripting. Web documents are written in HTML, while CSS defines the style and positioning of objects.

Of course, the key players in the browser market, Microsoft and Netscape, have never agreed on what Dynamic HTML consists of. Microsoft always referred to the acronym as "DHTML"; Netscape presented it as "dHTML." After that, it got complicated.

The champion of Web standards, the World Wide Web Consortium (W3C), has a role in all this. In December 1998, the DOM Level 1 Specification became a W3C Recommendation. CSS, Level 2, became a W3C Recommendation in May 1998.

At the risk of starting a religious war, let me say the differences between the vendors' views of Dynamic HTML will become irrelevant in short order; Netscape is in limbo while Sun absorbs the carcass that was spat out by America Online. Worse still, Netscape will probably stay in that state long enough for its market share to erode beyond recovery.

In effect and by default, Microsoft has won the browser battle and Microsoft's view of Dynamic HTML is going to have the greatest impact on market direction, the U.S. Department of Justice not withstanding.

So what does this mean to you? Well, Dynamic HTML is still very new and relatively rare on the public Web. Writing Dynamic HTML content that works cross-browser is still hard work. But that hard work can have a big payoff, and even the dullest content can acquire an air of dynamism.

Dynamic responses to gearhead@gibbs.com.

The OS grudge match

Next month at NetWorld+Interop, we'll be sponsoring a debate on the virtues of server-based operating systems. As you may have read, everybody from Redmond, Wash. (you know who), to Durham, N.C. (Red Hat Linux), will be there.

If you had only one chance to pose the most insightful question ever to operating system vendors, what would you ask? We've set up a forum to discuss questions for these folks. And if you want to discuss the relative merits of the operating systems, by all means do so. But maybe count to 10 first. As much as we'd love to see Linux and NetWare fans locked in mortal combat (after they finish with NT, of course), you know how Holy Wars can get.

DocFinder: 2528

Planning your Web site

Over the past few weeks, the tri-cornered techies down at The Motley Fool have busily described how to set up a server for one serious heavy-duty Web site. Great, but nobody's going to come to your site just to see what kind of server you're running. So what do you do about content? In this week's installment of Foo' Bar, techie Fool Keith Pelczarski lays out the steps to develop killer content, starting with design considerations.

DocFinder: 2531

Telephone line charges

Nothing seems to rile people more than Federal Communications Commission-mandated telephone charges. At least, that's what we have to conclude by the volume of mail we received last week in reaction to a news story on the FCC's decision to effectively increase the charge on households with more than one phone line. See what people had to say in the forum we set up to hold all the comments.

DocFinder: 2532

Who are you, really?

This week, we start Phase II of our ambitious plan to learn every single thing we can about every single one of you network professionals. Come online for the latest survey for our upcoming You Issue — tell us your favorite comic book, the talent you wish you had and more. Don't worry, we've made it easy to tell us, thanks to the miracle that is the modern HTML form.

DocFinder: 2524

Tool of the week

Want to stream video of your co-workers sleeping at their desks over your intranet? It's as easy as Video 1-2-3.

Developed by WebKapture, Video 1-2-3 can use just about any video, image or audio format to create streaming audio and video. Users can add voiceovers, text overlays and video effects to their creative works. Video 1-2-3 can output into RealNetworks G2 format or as a simple animated GIF. The software also exports to MP3, WAV and AVI file types.

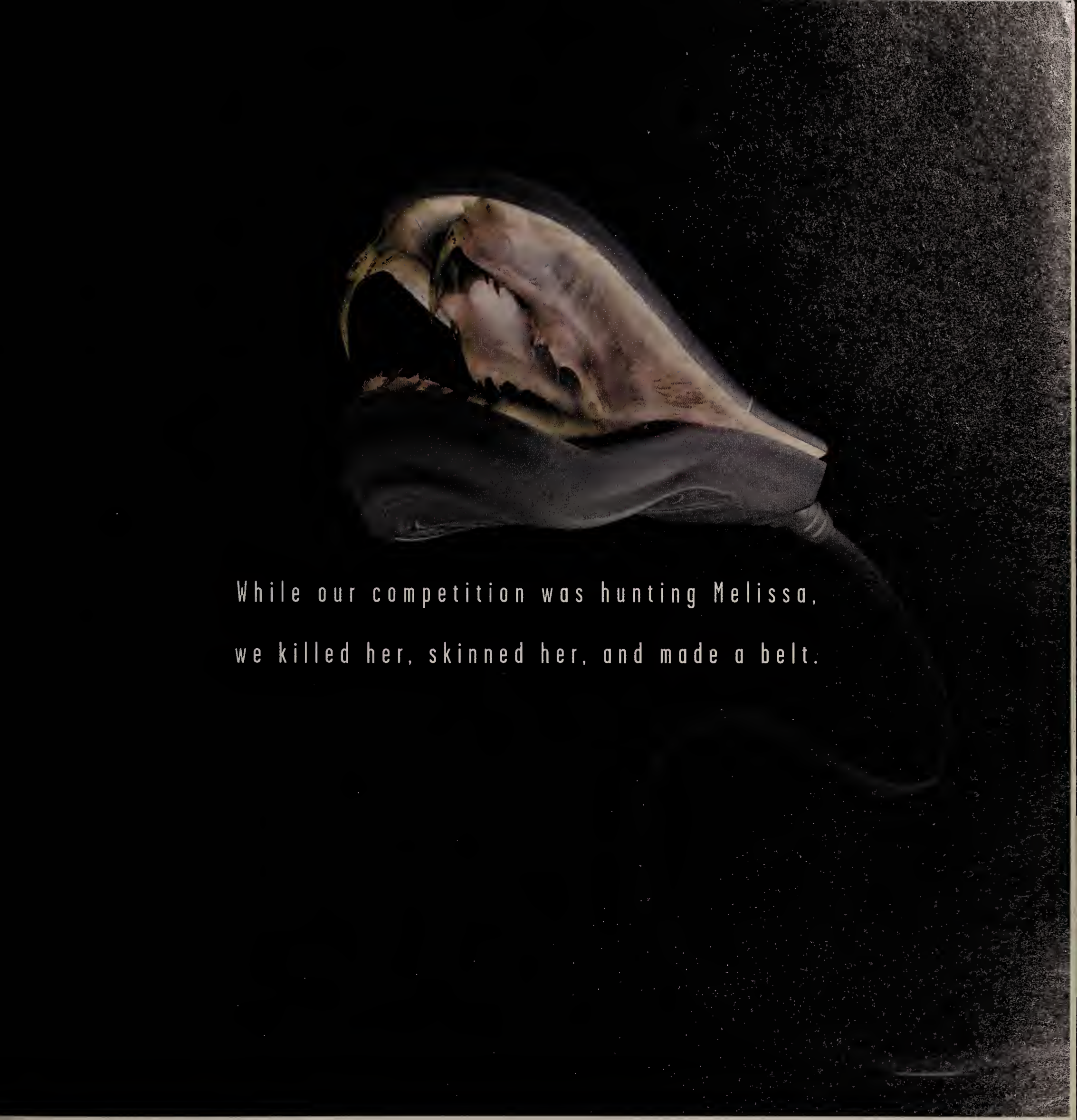
Video 1-2-3 is available for Windows 95, 98 and NT. Download the free trial version and other editing tools from our Downloads area.

DocFinder: 2534

Messaging newsletter

Twice a week, messaging guru Joel Snyder sends Network World Fusion Focus on Messaging subscribers tips on making their lives easier. In recent weeks, he's covered everything from e-mail/firewall interoperability issues to SMTP security. The newsletter is free and points you to additional resources for each topic. Before you sign up, take a look at the archive of recent newsletters.

DocFinder: 2533



If you hate viruses, imagine how we feel. Our job is detecting and eradicating them, and we do it better than anyone. So it's no surprise that we were the first to discover Melissa's venom, and first to provide customers with the cure in our McAfee product, Total Virus Defense Suite. Explaining once again why Network Associates is first with the FORTUNE 500.® To find out more, call 1-800-332-9966, dept. 6258, or visit www.nai.com. It's probably the safest place on the Internet.

network ASSOCIATES
Who's watching your network

Opinions

Editorial Insights

You need to become an M&A specialist

These days, you have to be savvy about dealing with the impact of mergers and acquisitions on your network department.

The news is filled with headlines of one giant deal after another, such as Lucent's planned $16 billion buyout of Ascend Communications and AT&T's multibillion-dollar deals for Teleport Communications, Tele-Communications, Inc. and IBM's Global Network.

But the real scope of M&A activity will blow you away. Last year was the biggest ever for mergers, with more than 12,500 deals involving at least one U.S. company. Eight of the 10 largest deals of all time occurred in 1998, with seven of those valued at more than $50 billion.

According to M&A specialists Broadview Associates, in 1998 there were 2,700 mergers and acquisitions in the software, hardware and telecommunications markets alone. The value of that M&A activity leaped nearly 90% from 1997 to a half-trillion dollars. Companies chose to be acquired 13 times more often than they went public in 1998.

Thanks to a robust stock market, this year is proving to be no different. Cisco has made three major acquisitions in the past week, including the $2 billion buyout of call-center company GeoTel. Nortel last week snapped up Shasta Networks for $340 million, and Ericsson grabbed two U.S. companies for nearly $500 million, continuing a recent string of purchases by major European players shoring up their data network offerings.

One reaction to this trend could be to shy away from start-ups and small suppliers. But that would be shortsighted. These are the companies bringing innovation to the market and needling the giant vendors into action. A better approach is to develop a plan to help you get by with minimum pain if one of your small or large suppliers is acquired.

As soon as you hear about a merger, you should contact someone at the highest appropriate level to find out how your support needs will be handled during and after the transition, as well as what's likely to happen to your equipment in a future product integration scheme. If you'll have to make changes, insist on compensation or discounts. Make sure your concerns are noted. Be the squeaky wheel that gets the grease during the transition period to come.

All the big vendors have M&A specialists. You need to be one, too.

— John Gallant
jgallant@nww.com

Message Queue

BLACKLIST WOES

In his letter to the editor, Nick Nicholas, executive director of the Mail Abuse Prevention System (MAPS), states "... no site is ever added to the [Realtime Blackhole List] without MAPS first having made attempts to contact it. We always give sites an opportunity to defend their practices or correct their problems before being added to the RBL" ("More on MAPS," March 29, page 38). This is not true.

Earlier this year, my organization's e-mail system was the target of a spam attack. We did not have any antirelaying controls in place. We had no idea we had been placed on the RBL until sites that use the list started bouncing our e-mails back to us. I had never heard of the RBL, so I checked out MAPS' Web site. Then I tried to contact MAPS by phone, but I just got a recording telling me to leave a message. I did, but no one got back to me.

I sent an e-mail to MAPS and got a blunt response, in effect telling me it couldn't help me with anything until I resolved the problem. I was calling to ask them what the problem was!

Finally, I discussed the situation with a representative from my ISP. He explained that I needed to install antirelay controls and explained how to do it. I then had to contact MAPS again, and it finally removed my organization from the RBL. Had MAPS contacted us before adding us to the list, as Nicholas says is standard operating procedure, we might have avoided a lot of problems.

Marc Gosselin
Director, Computer Services
Franklin Pierce Law Center
Concord, N.H.

START ME UP

Doug Barney's lament that today's start-ups seem like plain wimps ("Attack of the lame start-ups," March 22, page 50) makes me believe he has never been involved with a start-up. It's a difficult path to choose, and you have to start somewhere.

When Microsoft came out with Word in the early 1980s, it was a terrific alternative to Wang and WordStar.

Did we complain that Microsoft was a shallow company with one product — that we wanted to see it create plans to take over the software world or else we would dismiss it as a niche player? No. We just wondered where Microsoft would go and if it could maintain quality. When I joined a start-up in 1984 (which, in 1988, became Xpedite Systems), we had a plan to exploit a niche, and we did just that. We succeeded in building a company that was bought by another early last year. There were fits and starts, ups and downs, but we got the money and made it all happen with a lot of hard work and persistence.

Barney seems not to appreciate that even having the ability to see an unexploited niche in today's crowded marketplace sometimes is enough to get start-up money. Personally, I think that is great. Good ideas need nourishment. If you do not have a focus and a plan, just a vague scheme in mind that you want to be the next Microsoft, the marketplace will most likely terminate you. I'm still part of Xpedite, that little start-up that succeeded. We're a big company now, an American success story. We even turned our niche into an industry.

And now what? Do I want to relax and glory in our success? Nah. Let the suits who run the business now do that. I want to be part of another start-up. You know, one of those little companies that make sense only to people who understand the value of those subsectors.

Marion Bartholomew
Director, Product and Services Training
Xpedite Systems
Eatontown, N.J.

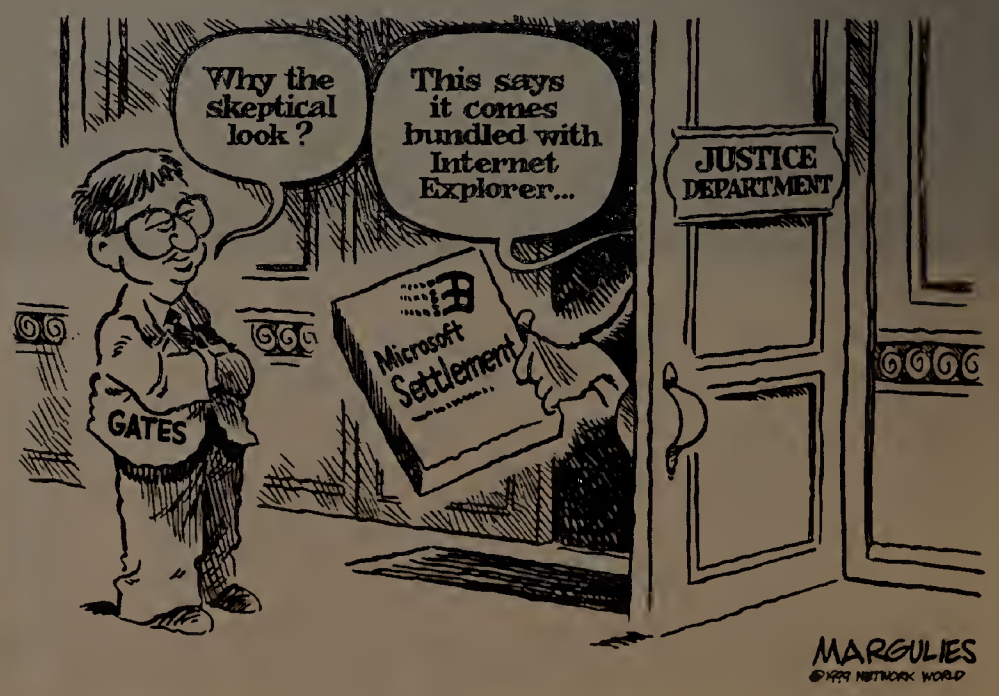
JUST THE FACTS

I found Mark Gibbs' "Backspin" column ("Novell thinking big and small," March 29, page 62) disheartening. I use many operating systems, and my all-time favorite is NetWare. I cannot believe we live in a world where inferior products beat out solid proven products.

I applaud Novell CEO Eric Schmidt for not contributing to the marketing frenzy. Just the facts, that's all one needs. Well, that and a stable operating system. Novell has already given us that.

Lorri McDaniel
Boston

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.



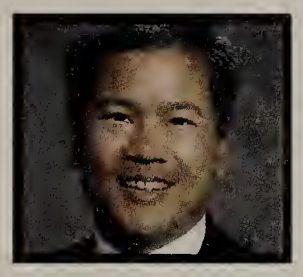
Venture Over the Horizon . Kevin Fong

DATA BROADCASTING: COMING TO A PC NEAR YOU

Yahoo's acquisition of Internet data broadcaster Broadcast.com earlier this month produced a lot of clucking in the media about the way in which "overvalued" Internet stocks are changing not only daily stock-market averages but the merger and acquisition business as well. While this concern has some merit, it misses the larger issue behind the acquisition: the rise of data broadcasting.

In its current form, data broadcasting is defined as the transmission of data, audio and video from one source to many users over the Internet. The drawbacks to using the Internet for broadcasting are that it is expensive and the broadcast can easily overwhelm the network when a large number of users log on. A poorly performing television show may have nine million viewers. By comparison, the 1.5 million viewers who recently logged on to the Internet to watch the video of a Victoria's Secret fashion show created such delays that they crushed the Internet infrastructure.

A better way to broadcast video, however, is on the horizon and owes much to the transition to digital television. The success of direct-to-home satellite services, such as DirecTV, have already proven the demand for digital television. To accommodate the need to deliver digital high-definition pictures, the Federal Communications Commission gave terrestrial TV broadcasters additional spectrum. This spectrum could be used to broadcast not just sharper pictures but data, as well. In fact, once TV broadcasts go digital, it will be possible to combine traditional TV programming and Internet or Web-cached data and broadcast them as one digital stream to a TV or PC.



Data broadcasting will provide a number of opportunities for public and venture-backed companies to supply hosting and archiving, infrastructure, service and end-user playback. Skystream (a Mayfield Fund investment), WavePhore, iBEAM Broadcasting and Microtune are some of the companies that have been formed to take advantage of these opportunities.

New technological capabilities translate into new ways of doing things. This is certainly true within the enterprise, where the applications for data broadcasting are far-reaching. Today, for example, when a company wants to hold a videoconference with its key analysts, a network has to be set up by leasing satellite transponder space well in advance of the meeting. With data broadcasting, the net is always available, allowing a firm to respond quickly to news, such as earnings releases or new product announcements from competitors. In addition, such conferences could reach a much wider audience than the narrow group reached today.

Product rollouts, training and companywide announcements are other ideal enterprise applications for data broadcasting. But these applications are not going to appear overnight. The pieces of the necessary infrastructure are just beginning to appear. Used correctly, however, data broadcasting will provide very powerful tools for corporate users.

Fong is a general partner of Mayfield Fund, a venture capital firm in Menlo Park, Calif. He can be reached at kfong@mayfield.com.

Reality Check . Thomas Nolle

IT'S A BUMPY ROAD TO THE GIGA DESKTOP HIGHWAY

With the ratification of the 802.3ab specification, the IEEE is paving the way for Gigabit Ethernet over copper. Chip vendors are lining up to provide products, and we'll probably see some switches before year-end. Does this mean that everyone will run out and buy giga desktops? Does it mean that fiber to the desktop is dead? These are good questions to start considering.

No. 1 on most users' issue lists will be whether their existing Category 5 cabling will support the new standard. Gigabit Ethernet uses all four pairs of the cable, compared with two pairs for 100Base-T, and Gigabit Ethernet is sensitive to some parameters of cable installation that weren't always part of the cable testing process.

The industry estimates that about 10% of existing Category 5 cable was installed improperly and may not meet the new specification's requirements. In many cases, the experts say, the problem can be solved by reinstalling the terminating plugs and sockets because the wiring itself should be OK. But if you've had any problems with 100Base-T, bet that gigabit over copper isn't going to work for you.

If you currently have Category 5 cable installed, have your wiring tested by a competent installer for compliance with the new specifications. If you're installing new cable and want to keep your gigabit options open, consider Enhanced Category 5 or new Category 6 cabling. Beware in the latter case: The final standard is still being developed, and some wiring and installation labeled Category 6 may not comply with the real specifications.

Even if your wiring is OK, gigabit desktops aren't a slam-dunk decision. Despite what sports car ads say, faster isn't always better.

Today, only about 19% of desktops are even on switched LANs, and about half of these are operating at 100M bit/sec. The penetration of switched LANs into the network market is roughly the same as the percentage of LAN users who are elite workers — those whose jobs demand the fastest access to the broadest range of corporate data.

It's fair to assume that elite workers would be the most likely targets of early gigabit-to-the-desk investment. But we have largely moved these workers to fast switched LANs already — and relatively recently. Most organizations aren't in any hurry to rush out and buy the next-generation product when the current generation isn't even fully depreciated. Are they wrong?

Giga supporters would assert that buyers risk suffering horrible performance problems that gigabit technology could cure. According to the Gigabit Ethernet Alliance, applications such as video production, complex graphics, multimedia and CAD would be the likely targets of Gigabit Ethernet to the desktop. But the people who run these applications are already 100M bit/sec Ethernet users. Is there enough difference in performance to justify the upgrade cost?

Let's take the performance part first. A 100M-byte file could be moved at 100M bit/sec in about 10 seconds, allowing for packet overhead. Gigabit Ethernet would move it in one second. Most people would be happy with the 10-second level of performance for 100M bytes, and most users won't have even one such file to move.

What about cost, then? Certainly the copper form of Gigabit Ethernet will be less expensive than the fiber form, but that could still be as much as 10 times the cost of 100Base-T Ethernet. And the cost of the upgrade probably won't be just the cost of the gigabit desktop ports and adapters.

If we move gigabit access to the desktop, we'll have to upgrade the capacity of the switches between the desktops — at all levels in the switched LAN hierarchy. Upgrade it to what? There's no terabit Ethernet yet.

A final issue is the interaction between giga users and the old-fashioned 10M bit/sec users. With a hundred times the speed of their stone-age partners, our giga desktops could quickly swamp 10M bit/sec users, blow switch buffer space, drop packets and generally create network chaos that may take days to unravel.

For most users, the time's not right for gigabit over copper. Early costs will be high, early impact on the rest of the network will be hard to predict, and the value of fiber as the last-and-best way to support power users is still being debated. Wait a couple of years and let the dust settle on all these issues while prices decline.

For now, 100Base-T is still the best desktop superhighway.

Nolle is president of CIMI Corp., a technology assessment firm in Voorhees, N.J. He can be reached at (609) 753-0004 or tnolle@cimicorp.com.

ANCIENT DILEMMA

YOU WANT A LEADING EDGE NETWORK PRINTER WITHOUT PAYING A LOT UP FRONT.

SO LEASE A 32PPM XEROX NETWORK LASER PRINTER FOR ONLY $99 A MONTH. IT'S ONE SMART CALL:

1-800-34-XEROX

THE DOCUMENT COMPANY

The 32PPM Xerox DocuPrint N32 will visibly boost your whole workgroup's productivity. Add finishing and stapling options, and anyone can produce 2-sided, stapled documents right from the desktop. Fast. And this is just one of the attractive leasing programs we're now offering on our celebrated DocuPrint family of laser printers.* So what are you waiting for? Call us or visit our website at www.xerox.networkprinters.com/lease.

KEEP THE CONVERSATION GOING. SHARE THE KNOWLEDGE.

*$99 for DocuPrint N32 based on 36-month lease and an estimated street price of $2,800. Payment may vary depending on lease term, options and equipment; shipping and taxes extra.

Free Product info enter NWInfoXpress #47 online @ **www.networkworld.com/Infoxpress**

Feature

MINDING YOUR QoS p's AND Q's

BY CHARLES BRUNO AND KEVIN TOLLY

A pair of IEEE standards makes it possible to implement prioritization services across Layer 2 switched networks, but first you'll want to consider queuing and testing issues.

Switch vendors have been preaching for years about mission-critical traffic, such as financial transactions, real-time production data and live video feeds, but now vendors are finally getting around to implementing a tagging scheme that allows switches to recognize such traffic.

The ratification last September of the IEEE 802.1p specification for Layer 2 bandwidth prioritization services has paved the way for standards-based multivendor quality of service (QoS).

Switches that support 802.1p — in conjunction with an existing 802.1Q standard for virtual LAN tagging — are hitting the market. In fact, it's rare to find a switch that isn't purported to support the two standards.

But there is more to establishing prioritization services than simply dropping a few switches into your network. Although 802.1p and 802.1Q provide a framework for bandwidth prioritization, the latitude the standards give vendors in implementing the bandwidth prioritization capabilities raises some deployment issues.

Before you implement 802.1p- and 802.1Q-enabled switches, analyze the traffic streams they generate to better understand the degree of support the devices provide. This analysis will give you an idea of the level of prioritization you can offer across the enterprise.

Unless you mind your 802.1 p's and Q's, you may find yourself with a high-priority problem on your hands.

The ABCs of p and Q

The whole concept of prioritization stems from QoS, which refers to a set of characteristics that define the delivery behavior of different types of network traffic and provide certain guarantees. The characteristics most often defined are throughput, latency or transit delay, variation or jitter, availability of service, and acceptable error rates or packet loss.

An extension of QoS, prioritization is the means by which certain frames are given preferential treatment over others. Prioritization services let Layer 2 switches offer QoS to differentiate between packets and handle them differently based on their tags.

The 802.1p specification allows switches and other devices to prioritize traffic into one of eight defined classes.

The highest priority is Class 7, which is reserved for network control data such as Open Shortest Path First or Routing Information Protocol table updates. Classes 5 and 6 might be used for delay-sensitive traffic such as video or voice. Data Classes 4 through 1 range from controlled-load applications, such as streaming, down to loss-eligible traffic, such as File Transfer Protocol. The Zero Class is reserved for "best effort" delivery and is invoked when no other class is set.

The IEEE doesn't require vendors to implement all eight classes, however, so many only support a subset of the traffic class definitions. As a result, you'll need to map your traffic classes to the queues of each switch in your network.

And while 802.1p provides a mechanism for the prioritization of frame traffic, Ethernet frames don't carry a priority field in their headers — that's where 802.1Q comes in. The 802.1Q specification defines a 32-bit tag header that contains a three-bit field for identifying a frame's priority level (see graphic).

No uniform approach

Although switch vendors agree that 802.1p and 802.1Q should be used to prioritize and tag frames, there's no single uniform approach to implementing the underlying queuing mechanisms.

Many switches just support two or three priority queues because vendors don't believe that eight levels of granularity make practical sense. Some industry pundits have predicted that edge switches will be available with two traffic queues, while core network switches may offer as many as four queues.

The number of traffic queues that a switch supports raises some interesting issues. For example, a switch might assign values of 0 to 3 to a low-priority queue, and priority classes 4 to 7 to a high-priority queue. This essentially reduces the priority classes to two. In this scenario, a mission-critical Class 7 packet rides alongside Class 4 traffic.

Switches with more than two traffic queues are able to offer a broader range of priority classes. The trick is to understand how a vendor has mapped different priority classes to those queues. For example, if two switches support the same number of traffic queues, one switch might lump Class 3 traffic into a low-priority queue, while the other may slot that same traffic to a high-priority queue. These switches would forward the same type of traffic with markedly different results.

Consider what could happen to a traffic stream as it makes its way through several switches that have their own way of mapping priority classes to available queues. Even though an application may request top-priority service, it may end up vying for bandwidth with lower-priority traffic.

Be sure to consider how switch vendors implement priority queues within their devices. Moreover, pay strict attention to how the vendor maps each of these queues to the eight priority classes defined in 802.1p.

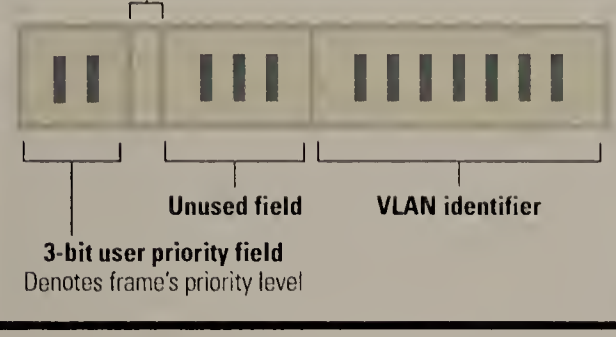
Testing to a degree

Although 802.1p and 802.1Q are major additions to Layer 2 switching, all it takes for most network analyzers to recognize prioritization traffic is a decode upgrade that you can get from a vendor's Web site. Our hands-on tests of network analyzers found that 802.1p and 802.1Q integrate fairly seamlessly with each tool's frame generation and frame decode capabilities.

When you deploy new QoS-enabled switches in your network, you'll be able to perform rudimentary tests with most popular network analyzers by creat

Your tag is showing

The IEEE 802.1Q specification provides a 32-bit header for VLAN frame tagging, of which 16 bits are shown here. Each 802.1Q tag sits in an Ethernet frame between the source address field and the media access control (MAC) client type/length field.



ing frames with most permutations of the 32 bits contained in 802.1Q. This simulated traffic will trigger a switch's virtual LAN and prioritization services and let you verify their operation.

We used a Netcom Systems SmartBits-2000 chassis outfitted with ML-7710 Layer 3 cards and an Ixia Communications IXIA1600 chassis equipped with LM-100TX modules to generate traffic for all user priority classes. In addition to serving as a frame generator, the IXIA1600 also can decode 802.1p and 802.1Q traffic.

Next, we tested the ability of Wandel & Goltermann's DominoLAN analyzer (using DominoCORE Version 2.4) and Hewlett-Packard's Internet Advisor (running Fast Ethernet mainframe 10.000.01) to decode 802.1p traffic. We configured each traffic stream for a particular user priority and transmitted the simulated traffic to the analyzers.

After each test, engineers verified that DominoLAN and Internet Advisor successfully decoded the user priority class and the associated VLAN information.

Using existing LAN analyzers to decode prioritized traffic can come in handy. We have found instances in which switches improperly strip 802.1Q tags from a frame, effectively limiting prioritized data to a single hop, instead of enabling it to cross all Layer 2 hops.

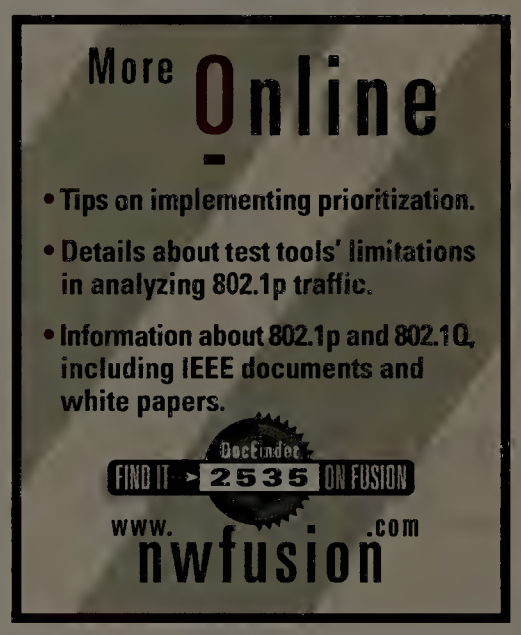
Another interesting phenomenon we discovered through testing is that prioritization is meaningless unless you reach a congestion level of 100% on a given output port. For example, if your switch is supporting two streams at 80% port capacity, prioritization services don't kick in because there's no contention for bandwidth.

The good news is network analyzers will help you scope out some fundamental performance issues, such as whether a switch is tagging priority frames correctly.

The bad news is if you want to determine how a switch actually prioritizes your data, you'll need some fairly sophisticated tests that go beyond simple frame generation and decodes.

There's little available in terms of canned applications that help you characterize switch behavior, but we are teaming with Netcom Systems to build just such a suite of tests. We will make these tests publicly available as soon as they are completed.

As we develop those switch behavior tests, we're conducting a lot of prioritization tests to examine the impact of variables such as variation in frame size, percentage of demand from input ports, and other factors that influence the effectiveness of prioritization services.



A top priority

As early adopters begin deploying 802.1p- and 802.1Q-enabled switches in their networks, existing tools will be instrumental in confirming whether the switches can process prioritized datastreams. However, the tools still have a ways to go.

Network managers increasingly will need sophisticated benchmarking applications to help them identify how network devices prioritize data, and more importantly, how queuing mechanisms impact the flow of that data.

Without a doubt, 802.1p and 802.1Q services are long-awaited advancements for Layer 2 networks. The catch is that the effectiveness of these services will hinge largely on the network manager's ability to identify the fine-grained prioritization issues that are inherent in each switch and network adapter that prioritizes and passes frames.

Minding your 802.1 p's and Q's will give you greater control over bandwidth usage, but the trade-off is you'll need to work harder at managing vendor gear. In order for prioritization to succeed in your organization, that chore must become a high priority.

Bruno is managing editor of Publishing Products, and Tolly is president and CEO of The Tolly Group. They can be reached at cbruno@tolly .com and ktolly@tolly.com, respectively. Engineers Greg Kilmartin and Tom Callas of The Tolly Group contributed to this story.

Hey readers!

TRY OUT OUR NEW ONLINE Readers Favorites & Greatest Survey

"We have met the enemy, and he is us." — **Pogo**

Don't miss your chance to stand up and be counted on 50 of perhaps the most consequential issues of this, or any other, millennium.

We'll be online with five questions per week for the next 10 weeks. Answer just five at a time, or complete the whole survey at once. On July 26, we'll publish the results in our *You* issue, and you'll be able to see how your answers compare with those of fellow *Network World* readers.

Get your corporate work out of the way early today, and get down to some decent Web interactivity at **www.nwfusion.com, DocFinder: 2524.**

Here are this week's questions. Enjoy.

1. Only brand of jeans worth wearing (stretch brands prohibited)
2. No. 1 vacation destination
3. Favorite painting or other work of art (we're serious)
4. Favorite hobby
5. Favorite stock you intend to keep long-term (day traders banned from answering)

New NetOp 6.0

Type-and-talk communication—ideal for support functions

Delta file transfer, crash recovery, copy, move, clone, and synchronize features

Fast and easy drag-and-drop file transfer

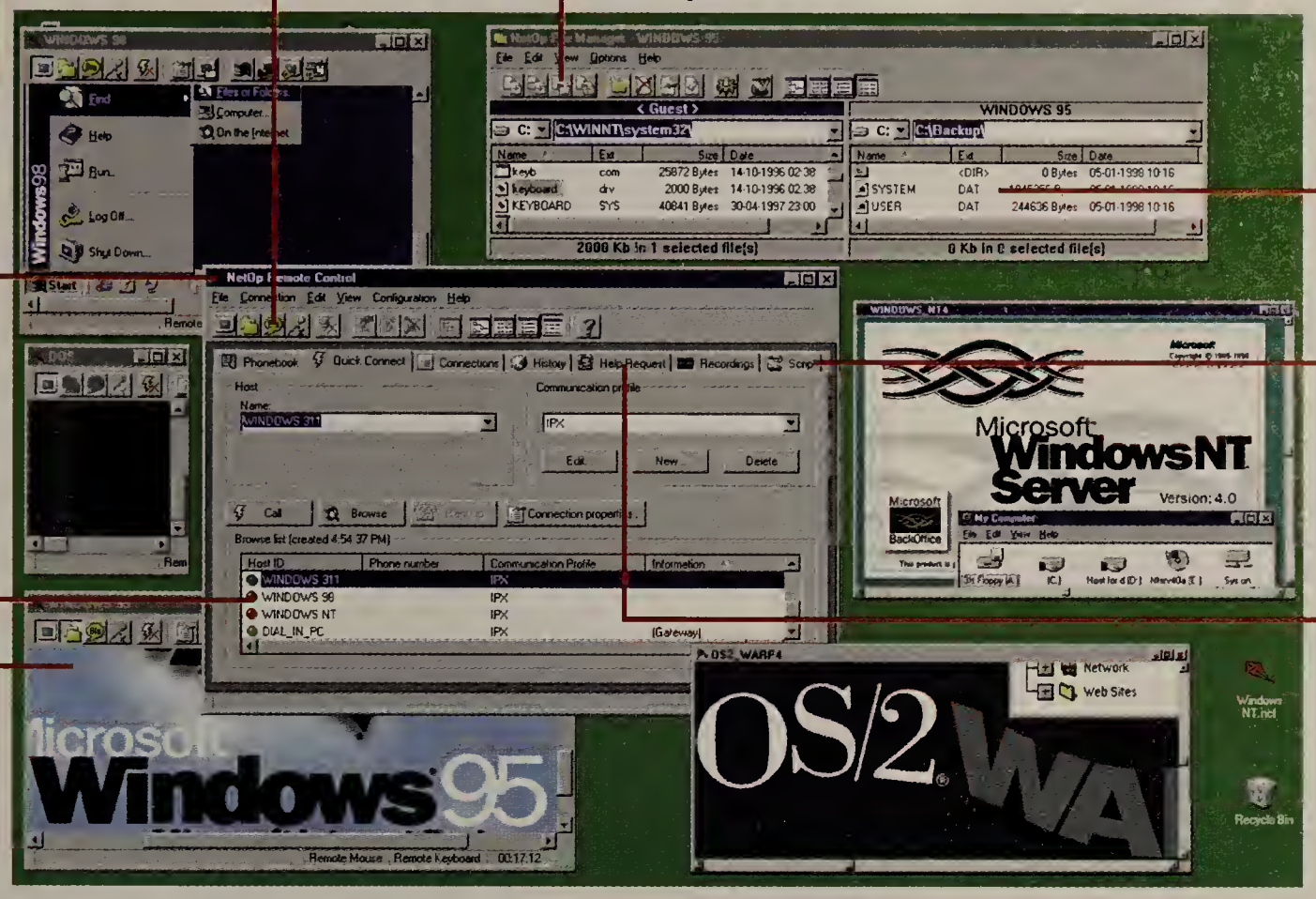
Full Range of security options

Powerful scripting tool for scheduled transfers and program launches

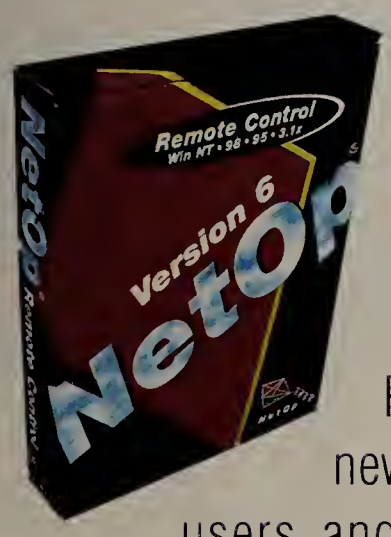
Simple browse-and-click PC connection

Individual windows or full-screen zoom in any resolution

Sophisticated help-request feature



NetOp Introduces a faster way to Remote Control any PC on any platform



The product PC Magazine called "fastest by far" running Windows over networks has gotten even faster — up to 75% faster! You're invited to try the **NEW** NetOp Remote Control for Windows v6.0. NetOp works on every PC in your company: Windows NT, 95/98, older Windows 3.X or DOS machines and even OS/2. Plus you can control distant PC's over modems, networks or the Internet. With advanced security options and new help desk features, NetOp is ideal for network administration, supporting users and providing superior dial-in for remote computing. ***Best of all — you can try it FREE!*** **Call us at 800-675-0729 or download your fully-functional evaluation copy at www.CrossTec.Net.**

Ask about NetOp School: Six essential tools for the networked classroom.

CrossTec Corporation

NetOp is available from CrossTec Corporation

Networking in a New Light: Extending Fiber Beyond the Backbone

Fiber or copper? Which to choose? As IT professionals expand their network or look for additional bandwidth, they are faced with a dilemma when choosing premises cabling. Fiber and copper cable vendors alike are touting dramatic advances that present compelling reasons to install one or the other. They can't both be right.

To answer that question, you need to think about cabling in a new light. Join *Network World* and The Tolly Group, along with 3M and Corning, at a dynamic, interactive, half-day seminar designed to help you make the mission-critical decisions that will improve the quality of your network.

This FREE 1/2 day seminar provides you with insight into 3M and Corning innovations in fiber technology and offers these additional benefits:

- *Discover the business advantages of both fiber and copper cabling in today's high-performance networks.*
- *Explore the cost savings associated with the new "passive wiring closet" design.*
- *Explore new designs in fiber optic solutions that have fundamentally altered the copper vs. fiber decision.*
- *Develop a cabling strategy that will scale for five to ten years.*
- *Ask questions of John Curtis, 3M and Corning representatives during the interactive roundtable and Q&A sessions.*

Enter to win a free DVD Player at each seminar

To register: call **888-800-6300**
or visit us on the web at
www.nwfusion.com/seminars/3m

PRODUCED BY:

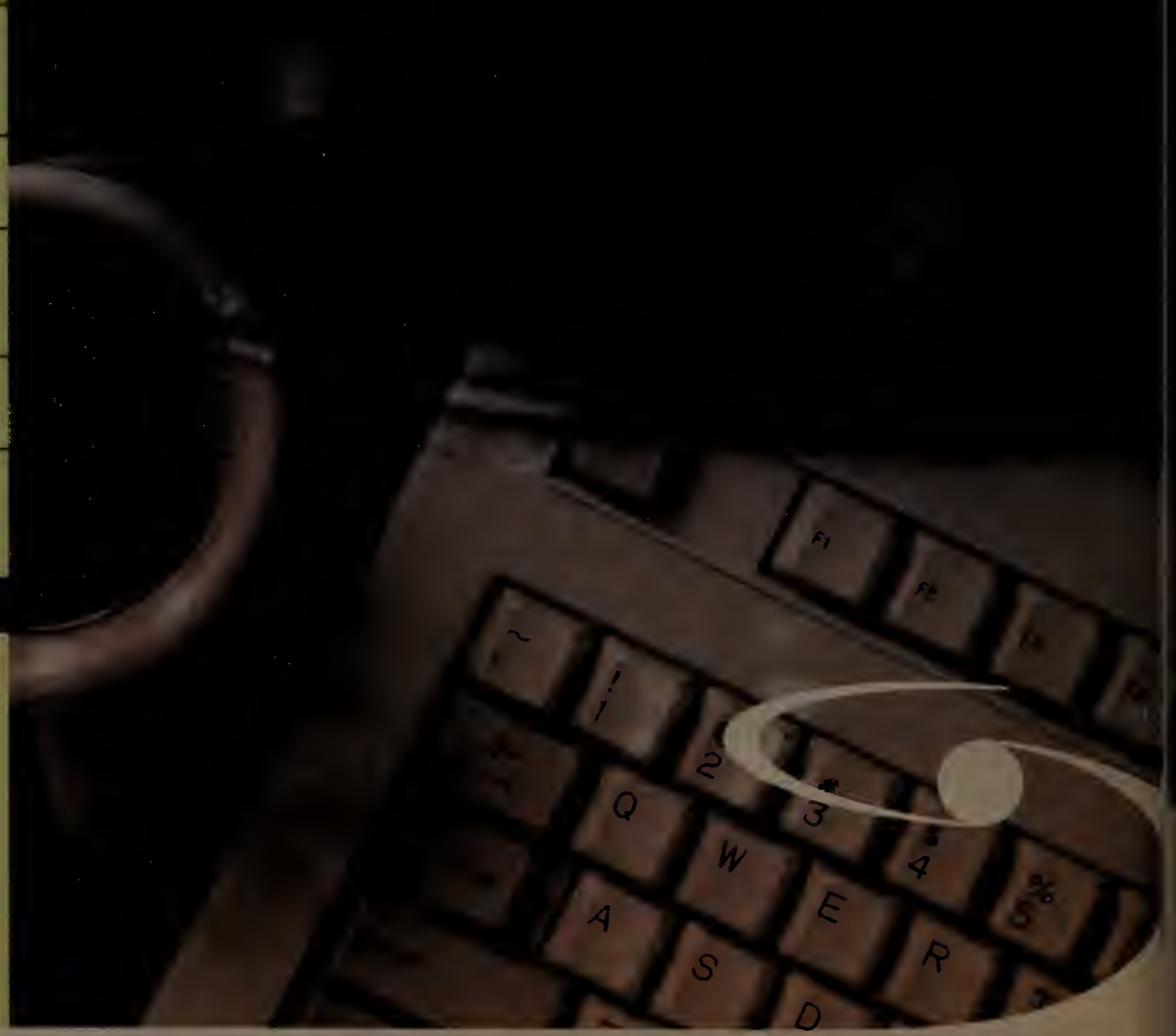
NetworkWorld

Schedule

4/27/99	New York
4/28/99	Boston
5/5/99	Chicago
5/6/99	Washington, DC
5/18/99	Dallas
5/19/99	Atlanta
6/2/99	Seattle
6/3/99	Minneapolis
6/15/99	San Francisco
6/16/99	Los Angeles

Keynote Address by John Curtis

THE TOLLY GROUP



CO-SPONSORED BY:
CORNING

3M Volition™
Fiber to the desk. Today.

Feature

POLICING POLLUTION

Continued from page 1

"The company could not imagine it had such an employee working for them," Devaney says. "In this case, our involvement cleared the company of criminal wrongdoing, but the company still had to pay the cleanup costs."

Environmental crime is the crime of the future, according to Gary Winston, assistant state attorney and head of the environmental crimes division of the Florida State Attorney's Office in Miami. And increasingly, environmental violations are being conducted over networks.

"Because valves and devices are controlled by computers, electronic forms of terrorism can now be directed at the environment," Devaney explains.

> ***"Since valves and devices are controlled by computers, electronic forms of terrorism can now be directed at the environment."***
>
> Earl Devaney, director, the EPA's Office of Criminal Enforcement, Forensics and Training.

Oil spills are bad enough, but just about any hazardous material or toxin could potentially be leaked into the environment if the control device is linked to the network.

Along with the OCEFT's efforts, state police and prosecutors like Winston are getting tough on environmental crime. Last year, Winston's office processed more than 200 environmental crime cases — wetlands destruction, unlawful dredging of protected bays, illegal transport and dumping of hazardous materials, to name a few.

In many of those cases, networks were used to commit the crimes. In other cases, networks stored records used as evidence in criminal trials.

The federal government regulates hazardous waste primarily through the use of manifests, which log where hazardous waste is transported. Because most manifest records are kept in computers, the data makes for great evidence in criminal investigations, Winston says.

Devaney, who launched the computer crime training unit for the Secret Service's Office of Investigation in the 1980s, foresaw the coming of digitized crime against the environment. Now he's tackling the problem by developing the technical skills of the OCEFT's 200 armed enforcement agents.

"In today's world, people put most everything on computers. We need the forensics capability to go in and retrieve that information off the company's networks," Devaney says. His group shares its expertise with other law enforcement agencies that need help cracking complex environmental crime cases.

Last year, for example, Winston suspected an industrial facility of concealing the true amount of hazardous waste it produced. He couldn't find the evidence in electronic manifests, so he called in a forensics specialist from the OCEFT.

Instead of searching for outflow records, the agent told Winston to look for purchase orders and inventory logs — anything that would give him an idea of how many chemicals were being processed. Because each chemical results in a known amount of toxic waste, it wasn't hard to determine that the company was, indeed, falsifying its hazardous waste reports, Winston explains.

The OCEFT's training and forensics support lab is located in the EPA's Denver-based National Enforcement Investigations Center (NEIC), the technical and scientific expertise support laboratory for all of the EPA's civil and criminal investigations. The NEIC gained computer crime support capabilities in 1995 when Diana Love transferred from the technical unit of the EPA's air pollution prosecution district to manage the new functions.

According to Love, environmental regulations have been moving toward electronic monitoring and reporting — something she worries will open a new can of worms in terms of environmental reporting fraud.

When the opportunity to launch computer analysis support arose, she jumped at it. "I had been thinking about building a computer forensics team like this — high-level experts that could legally break into LANs and mainframes, retrieve deleted information and even reverse engineer the systems," she says. Her team also has high-level environmental knowledge.

Love's computer forensics team is analyzing software and hardware for 40 open environmental crime cases. True to her predictions, electronic filing of air pollution compliance is revealing new cases of fraud. Under the federally mandated automated reporting system, companies can electronically file their pollution emission reports to their designated EPA field offices.

According to Devaney, a handful of less-than-honest individuals are turning to black-market stealth programs that capture the readings from emission monitoring devices and doctor those readings to fit within compliance levels without the knowledge of network administrators. Then the rogue programs send the falsified reports to local or federal EPA regulatory offices.

Finding these programs is onerous work that often involves replicating the suspect network down to the minute detail. This means analyzing and rebuilding entire network segments. It can take four to six months just to produce a data set to analyze, Love says.

However, the EPA's efforts are paying off. Since 1991, the OCEFT has quadrupled its number of criminal investigators from 50 to 200. Fines against companies that commit environmental crimes rose to an average fine of $1.9 million in 1998. And some executives are doing jail time; the average sentence in 1998 was a little more than 15 months.

Winston attributes the rise in convictions and fines to Devaney's vision. "This should be a wake up call," Winston says. "There's an increasing trend to use criminal prosecution as another tool of enforcement."

Earl Devaney's team of investigators at the EPA's Office of Criminal Enforcement, Forensics and Training followed a trail of network activity that pinned the blame for a $3 million oil spill on a disgruntled employee.

Radcliff is a freelance writer in Northern California who specializes in reporting on high-tech crimes. She can be reached at DeRad@aol.com.

CABLE & WIRELESS
USA

Cable & Wireless USA has it. We have one of the most powerful, most reliable Internet backbones on the planet. A rock-solid, high-speed backbone built specifically to carry mission-critical data and applications. Letting you move terabytes of information—or take tens of millions of hits—in total confidence. See for yourself at **traffic.cwusa.com**.

For information call **1.800.969.9998** or you can visit us at **www.cwusa.com**.

BY GAIL JAMES
AND MIRYANA BUNIC

Review

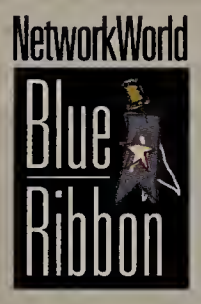
ALL-IN-ONE SECURITY APPLIANCES

Firewall and VPN combination devices simplify security.

Product: Firewall-1 4.0

Vendor: Check Point Software

Firewall-1 gets the job done with strong security features and a simple approach to deploying and managing site-to-site VPNs.



These days every organization has a firewall, and those that don't have a virtual private network (VPN) are probably planning to launch one. To simplify security management, vendors have created a new class of equipment that combines firewall security with VPN features. Vendors market the products under various names — Internet access devices, policy routers or VPN firewalls — but the products share a single goal: to provide secure network access to legitimate remote users and keep intruders out.

We looked at six such products. Our Blue Ribbon Award winner is Check Point Software's Firewall-1 4.0, a hardware and software combination that delivers comprehensive firewall and VPN features. Of the six products we tested, only Firewall-1 lets you define a single integrated security policy that can be distributed across multiple firewall gateways from a central location. Plus, the second or additional gateways don't have to be dedicated firewall boxes; Check Point creates added gateways with its Remote Link Module software that runs on Unix or Windows NT workstations.

Internet Devices' Fort Knox Policy Router F-3000 placed second in our tests. Administrators who are less concerned about installing multiple access devices throughout a large enterprise will like Fort Knox Policy Router. It has a well-organized graphical user interface (GUI) with an optional bandwidth manager software module, HTTP and Domain Name System (DNS) caching, and several other useful features that make it an excellent choice for small to mid-size VPN installations. However, Fort Knox Policy Router is the only product we tested that lacks direct access for a manager's console.

NetScreen Technologies' NetScreen-100, Technologic's Interceptor 4.0 and WatchGuard's Firebox II performed well but lacked many of the advanced features found in Firewall-1 and Fort Knox Policy Router (see our online features chart, DocFinder: 2523).

FreeGate's OneGate 1000 offers a little bit of everything but at the expense of usability. It includes a packet-filtering firewall, an IP router, two Web servers, an e-mail server and File Transfer Protocol (FTP), DNS and Dynamic Host Configuration Protocol services. However, OneGate is hard to configure and manage, and its firewall and VPN features are merely adequate. And, unlike the other five products we tested, OneGate doesn't provide an Ethernet port on its external WAN port interface. It provides only ISDN or T-1 access to the Internet, along with IP routing support.

Most of the appliances we tested use proprietary operating systems. The exceptions are Firewall-1, which runs under Microsoft Windows NT and Sun Solaris, and Firebox II, which runs under Linux.

Safety matters

If you're planning to buy one of these devices, firewall and VPN features are probably of equal importance to you. Today's firewalls generally use one of three common approaches to block or forward traffic (see story, page 58).

Only Check Point's Firewall-1 uses stateful inspection for filtering traffic. Stateful inspection uses a combination of packet filtering and application-layer processing to determine if a packet should be accepted or rejected. The method provides full application-layer awareness without requiring a separate proxy for every service to be secured. Fort Knox Policy Router, Interceptor, Firebox II and NetScreen-100 use a combination of packet filtering and application proxy, while OneGate uses standard packet filtering.

Implementing access control parameters lets you grant selective network access to authorized users, protect communications over untrusted public networks and detect network attacks. Firewall-1 and Fort Knox Policy Router offer the broadest selection of services and protocols. Firewall-1 has a very clear interface; Fort Knox Policy Router uses vague icons to describe services, which required us to repeatedly reference the icon legend.

Firebox II, Interceptor and NetScreen-100 did a good job of covering the basic services and protocols needed to define the firewall policies. OneGate offered limited flexibility for creating rules; the device only provides a few predefined policies that you can choose to activate.

We used Internet Security Systems' Internet Scanner 5.6 to find security vulnerabilities in the test sites protected by the products. The software tests for source porting, source routing, IP spoofing, brute force attempts, anonymous FTP checks, and denial-of-service attacks. Internet Scanner then issues a pass or fail report with suggestions.

Each product passed the Internet Scanner tests, though Internet Scanner did find minor problems based on our setup. For example, Internet Scanner discovered traceroutes on all the boxes except Fort Knox Policy Router. These traceroutes create a potential backdoor for unwanted Internet traffic. To protect a network from this vulnerability, network administrators can simply create rules that disallow incoming User Datagram Protocol (UDP) and Internet Control Message Protocol (ICMP) packets with high-numbered destination ports. We'd like to see vendors document this more clearly so that administrators are aware of the risk.

To measure the impact the addition of one of these products would have on network performance, we used NetBench 5.0 from Ziff-Davis. With one client initiating a moderate level of traffic to the server —

ScoreCard

	Firewall features 25%	VPN features 25%	Management and reporting 20%	Performance 10%	Installation 10%	Documentation 10%	Total score
Firewall-1 4.0	9 x .25 = 2.25	9 x .25 = 2.25	8 x .20 = 1.60	9 x .10 = 0.90	8 x .10 = 0.80	9 x .10 = 0.90	8.70
Fort Knox Policy Router F-3000	8 x .25 = 2.00	8 x .25 = 2.00	9 x .20 = 1.80	9 x .10 = 0.90	6 x .10 = 0.60	6 x .10 = 0.60	7.90
NetScreen-100	7 x .25 = 1.75	7 x .25 = 1.75	6 x .20 = 1.20	9 x .10 = 0.90	8 x .10 = 0.80	6 x .10 = 0.60	7.00
Interceptor 4.0	6 x .25 = 1.50	6 x .25 = 1.50	8 x .20 = 1.60	9 x .10 = 0.90	7 x .10 = 0.70	6 x .10 = 0.60	6.80
Firebox II	6 x .25 = 1.50	6 x .25 = 1.50	6 x .20 = 1.20	9 x .10 = 0.90	5 x .10 = 0.50	5 x .10 = 0.50	6.10
OneGate 1000	5 x .25 = 1.25	5 x .25 = 1.25	6 x .20 = 1.20	9 x .10 = 0.90	7 x .10 = 0.70	4 x .10 = 0.40	5.70

Individual category scores are based on a scale of 1 to 10. **Percentages** are the weight given each category in determining the **total score.**

Net Results

Firewall-1 4.0
Check Point Software
(650) 628-2000; www.checkpoint.com/products/firewall-1/index.html
$2,995 to $16,995

Pros
- ▲ Most comprehensive firewall and VPN features
- ▲ Includes distributed firewall policy
- ▲ Multiple encryption schemes
- ▲ Supports client, user and session authentication

Cons
- ▼ Expensive for unlimited number of nodes

NetScreen-100
NetScreen Technologies
(800) 638-8296; www.netscreen.com/netscreen100.htm
$9,995

Pros
- ▲ Multibus system architecture
- ▲ Intuitive policy editor interface

Cons
- ▼ Supports only basic services for defining policies

Firebox II
WatchGuard Technologies
(206) 521-8340; www.watchguard.com/fireboxII.html
$4,990

Pros
- ▲ Least expensive for unlimited number of nodes

Cons
- ▼ Poorly documented installation

Fort Knox Policy Router F-3000
Internet Devices
(888) 237-2244; www.internetdevices.com/products/ftknox.html
$4,995 to $9,995

Pros
- ▲ Filters e-mail for spam
- ▲ Optional bandwidth manager software module
- ▲ Strong real-time monitoring and reporting tools
- ▲ Good graphical user interface

Cons
- ▼ Lacks direct access for a manager's console

Interceptor 4.0
Technologic
(800) 615-9911; www.tlogic.com/appliancedocs/index.html
$3,995 to $9,995

Pros
- ▲ Strong real-time monitoring and reporting tools
- ▲ Filters e-mail for spam

Cons
- ▼ Lacks support for a demilitarized zone

OneGate 1000
FreeGate
(408) 617-1000; www.freegate.com/products/
$6,690

Pros
- ▲ Includes DNS and DHCP services

Cons
- ▼ Difficult to configure and manage
- ▼ Missing second Ethernet port
- ▼ Limited selection of predefined policies

6M bit/sec of read/write requests and 12M bit/sec of random read requests — we found no appreciable differences in throughput when firewall and encryption functions were enabled vs. when they were disabled. This result means that the processor in each product was able to encrypt and decrypt under moderate traffic loads without slowing throughput.

Because security standards differ, we didn't try to saturate each connection with traffic to determine maximum throughput. Specifically, all of the boxes we tested support 56-bit Digital Encryption Standard (DES) encryption, while only Firewall-1, Fort Knox Policy Router, NetScreen-100 and OneGate also support 168-bit Triple-DES encryption. In terms of throughput, 168-bit Triple-DES requires more processing power and is necessarily slower than 56-bit DES under heavy load. However, the added security offsets the throughput loss.

Affordable access

The VPN capabilities in the boxes tested provide some method of data encryption so your company's traffic cannot be read by others while it travels over the Internet. In addition to 56-bit DES, all six products support VPN client, VPN remote site-to-site, network address translation and manual IP Security.

Check Point's Firewall-1 supports the full range of security standards and provides its own proprietary FWZ encryption scheme. Also, Firewall-1 does not require a second Firewall-1 box to complete the secure VPN. Firewall-1 has a software option called Remote Link Module that runs on NT- or Unix-based stations. In addition to supporting multiple encryption schemes, algorithms and key management, Firewall-1 passes digital certificates among its VPN firewall hosts. Therefore, potential intruders trying to pose as firewalls can be denied administrative privileges without a certificate.

When creating a VPN, as is true with a firewall, it is important to set up a partially protected demilitarized zone (DMZ) where you can place public servers, such as those for Web, FTP and e-mail. Only Technologic's Interceptor did not support the creation of a DMZ subnet.

Central management

For products of this type — those you expect to install in more than one spot on your local network and across multiple sites — centralized management tools and active monitoring capabilities are critical. All six products let you remotely manage multiple firewalls from a single console and provide real-time monitoring, DNS caching, URL filtering and IP traffic shaping. Fort Knox Policy Router and Interceptor supplied the most comprehensive real-time monitoring and reporting tools; they are also the only products we tested that filter e-mail to reduce spam.

Firewall-1 is the only product we tested that allows you to verify your policy set after making changes to find inconsistencies or overlapping rules. Once verified, you can choose to install from a centralized location the policy set on all enterprisewide firewalls or only on specific branches. We also found Firewall-1's logs to be helpful in understanding how the firewall was interpreting our rule sets.

Initial installations

Check Point's Firewall-1, Technologics' Interceptor, FreeGate's OneGate 1000 and NetScreen's NetScreen-100 allow you to perform the initial installation process and make any changes through a Web browser or a directly connected manage-

A SECURITY PRIMER

To evaluate firewalls or virtual private networks (VPN), you have to learn a new vocabulary. Most of today's firewall products forward or block traffic by implementing application proxy, packet filtering or circuit-level gateways.

Application-level firewalls, commonly referred to as proxy-level firewalls, are generally thought to offer better security from hackers by providing application-level awareness. However, throughput may suffer while the firewall device conducts the analysis.

Packet-filtering firewalls are typically the fastest and can block or forward traffic by IP address, packet type or service. However, because packet filtering operates on a packet-by-packet basis, packet-filtering firewalls can't monitor connections or offer the data analysis that other technologies can.

Circuit-level gateways forward or block traffic at the session layer. Most applications use a well-known port, so a circuit-level gateway assumes that the port is being used by its associated application and forwards or blocks traffic based on requested port access. This assumption isn't always well founded because hackers can use trusted ports to mount sophisticated attacks for improper activities.

There are several proposed security standards for VPNs. IP Security (IPSec), an encryption scheme that uses 56-bit Digital Encryption Standard (DES) or 168-bit Triple-DES keys, is the most commonly used. While Triple-DES offers superior security, it may reduce throughput under heavy load.

Other proposed VPN standards include ISAKMP/Oakley, which adds key management to IPSec; and SKIP, which was developed by Sun and uses a hierarchy of constantly changing keys and key management.

— Gail James and Miryana Bunic

Could the world's leading companies partner with

one vendor to solve customer network security issues?

Microsoft®

HEWLETT PACKARD

Sun microsystems

Entrust® TECHNOLOGIES

VeriSign™

Novell®

GTE

KPMG

CIGNA Property & Casualty

ERNST & YOUNG LLP

ment console.

Fort Knox Policy Router was the easiest to configure. The installation software downloads the VPN smart client from the host firewall during VPN installation. We had a little more trouble setting up Fort Knox products when we added a branch VPN and connected the two networks. We had to set up a VPN tunnel between two Fort Knox Policy Routers prior to enabling encryption between them.

We installed the Fort Knox Policy Router through a Web browser. The installation process let us choose between two different network configurations: transparent (often called single IP address), which allows you to install the unit without changing the IP addresses of your intranet's existing router; or split, in which each interface (trusted, external and DMZ) represents a different subnet.

Fort Knox Policy Router is the only unit we tested that doesn't provide an alternate modem or serial port for directly attaching a management console in case you are unable to establish a connection through a browser. We found this to be a disadvantage rather than a physical security advantage. However, we liked Fort Knox Policy Router's GUI best.

WatchGuard's Firebox II's installation process was the only one that required us to upload its configuration through Ethernet and serial cable connections concurrently. During the Firebox II installation we came across a "Waiting for Firebox II to boot" message that actually meant that we needed to recycle the power on Firebox II to continue installation.

We read the manual page by page but found nothing about shutting the Firebox II off and on during the boot process. Fortunately, WatchGuard's tech support staff was able to provide a translation to continue the installation. Check Point's Firewall-1 has excellent documentation, including fairly extensive tutorials for better understanding of the firewall and VPN principles. Other vendors provided detailed instructions on how to perform certain tasks, but little or no explanation of what was being created and why.

Bottom line

All the products we tested can get the job done. But in a feature-by-feature comparison, Check Point's Firewall-1 and Internet Devices' Fort Knox Policy Router stand out from the crowd.

Firewall-1's distributed firewall policy further distinguishes it from the competition; the ability to define and distribute a single firewall policy across multiple firewall gateways is a big draw for large enterprise sites.

NetScreen's NetScreen-100 and Technologic's Interceptor performed admirably but didn't provide more than the basic firewall and VPN features. Also, Technologic doesn't let you set up a DMZ and lacks support for Triple-DES.

WatchGuard's Firebox II also lacks Triple-DES support in its standard feature set and is hampered by poorly documented installation. Difficult configuration hurt the score of FreeGate's OneGate 1000, as did its limited selection of predefined policies.

Bunic is a network test engineer responsible for hands-on testing and James is a vice president of lab services at LANQuest Labs, an independent test lab specializing in network quality assurance, certification and performance testing. They can be reached at miryana@lanquest.com and gjames@lanquest.com, respectively.

Well yes, come to think of it, they could.

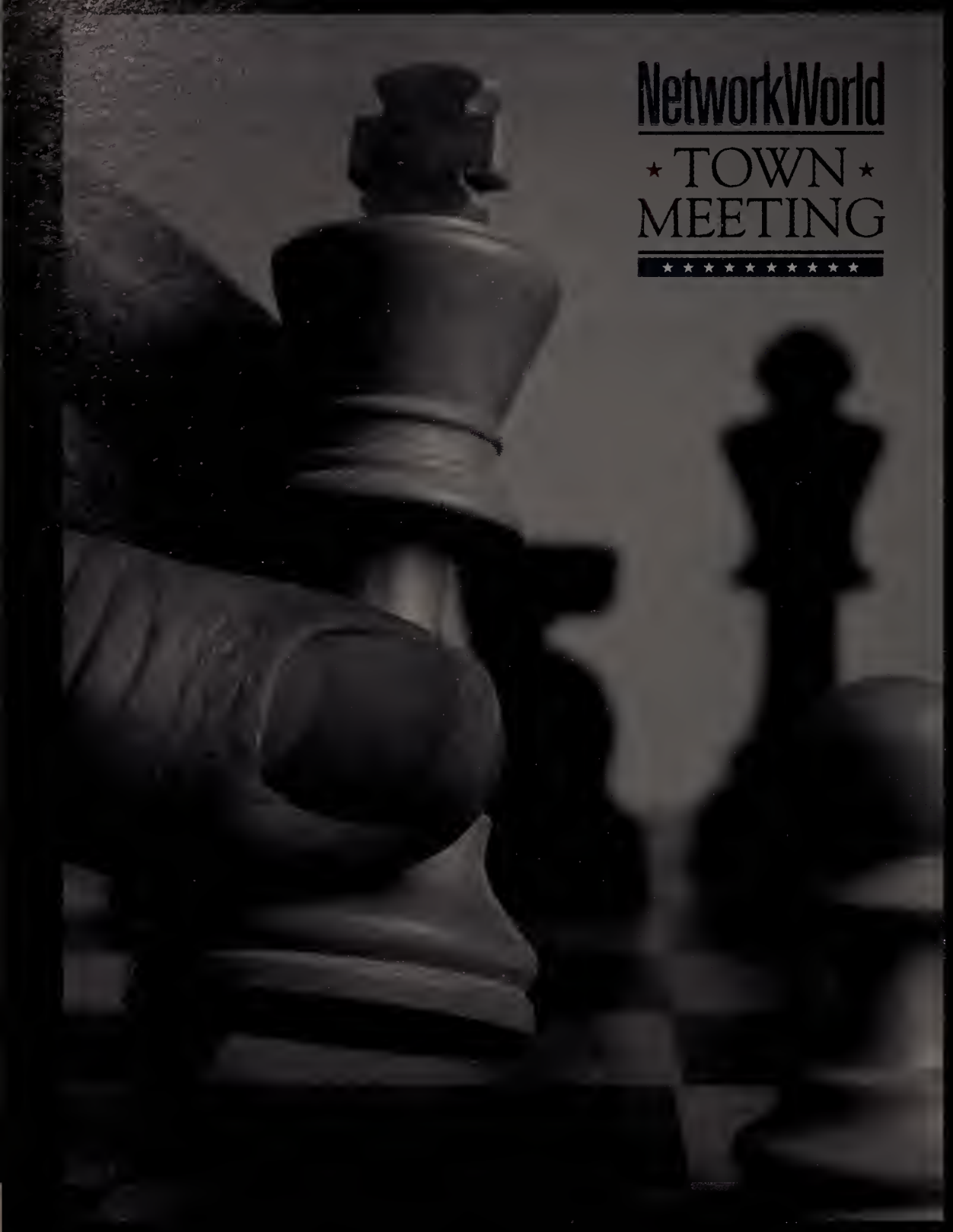
network ASSOCIATES

VIRTUALLY EVERYONE KNOWS THAT NETWORK ASSOCIATES IS THE LARGEST PROVIDER OF NETWORK SECURITY AND MANAGEMENT SOFTWARE. SO, WHO BETTER TO PARTNER WITH THE INDUSTRY'S TOP VENDORS AND CONSULTING ORGANIZATIONS TO CREATE A NEW, MORE ACTIVE APPROACH FOR SECURING MISSION-CRITICAL NETWORKS. THIS "ACTIVE SECURITY" BRINGS TOGETHER OUR BEST-OF-BREED SECURITY PRODUCTS, LIKE PGP VPN, GAUNTLET FIREWALL AND CYBERCOP INTRUSION PROTECTION, WITH THE BEST SECURITY PRODUCTS AND SERVICES OF OUR TECHNOLOGICAL PARTNERS. THE RESULT IS AN EVER-VIGILANT, IMPENETRABLE BARRIER AGAINST CYBER-TERRORISM. SO, HACKERS BEWARE. TO LEARN HOW NETWORK ASSOCIATES CAN WORK WITH YOUR COMPANY TO PROTECT YOUR ASSETS, CALL 1-800-332-9966, OR VISIT WWW.NAI.COM/ACTIVESECURITY. BECAUSE THE LAST THING YOUR NETWORK NEEDS IS SOME NASTY LITTLE SURPRISE.

network ASSOCIATES

Who's watching your network

CONTEMPLATING THE NEXT MOVE FOR YOUR WIDE AREA NETWORK?



1999 EVENT TOUR

New York, NY • June 2	**Washington, DC** • June 29
Boston, MA • June 3	**Atlanta, GA** • June 30
Dallas, TX • June 16	**San Francisco, CA** • July 12
Chicago, IL • June 17	**Irvine, CA** • July 13

STATE OF THE WAN:SM

Maximizing the Potential of Frame Relay, ATM and Emerging Network Services

LEARN FROM THE LEADER

The era of expensive, inflexible leased-line networks is over! So what's your next move? Public Frame Relay? ATM in the backbone? TCP/IP everywhere?

To ensure your WAN is well positioned for the future, join John Gallant, Editor in Chief of *Network World*, Dr. Jim Metzler and Debra Mielke, two leading industry analysts of The Metzler Group and Associates, and representatives from the leading WAN vendors for **State of the WAN. Maximizing the Potential of Frame Relay, ATM and Emerging Network Services**. Together, in this unique, interactive Town Meeting event, they confront the issues surrounding the ever-expanding areas of WAN technology and network services.

You will leave this seminar with the information you need to build, buy and manage the high-speed, reliable infrastructure your business applications demand; Intranets, Extranets, E-commerce and more.

FIND IT · 2034 · ON FUSION

Attend this FREE SEMINAR and get the answers to your most pressing WAN management questions:

- Compare and contrast the benefits of ATM, Frame Relay and other emerging Wide Area Networking technologies and services
- Learn to lower the cost of operations and support by effectively placing your voice traffic over data transmission services
- Understand Quality of Service (QoS) and the requirements for providing end-to-end QoS including equipment, reporting and staffing
- Probe vendor executives on plans for product rollouts, features sets and product support

MODERATORS

John Gallant, Editor in Chief, *Network World*

Dr. Jim Metzler and **Debra Mielke**, The Metzler Group and Associates

Ashton, Metzler & Associates
Leverage Technology and Talent for Success

REGISTRATION IS FREE!!

For more details and a complete program agenda, call (800) 643-4668 or on the web

www.nwfusion.com/townmeeting/wan

NetworkWorld
THE LEADER IN NETWORK KNOWLEDGE
Print · Online · Events

IN ASSOCIATION WITH: TELEPHONY®

PRESENTING SPONSORS:

ADC Kentrox® The Network Access Company™ · AT&T · EQUANT · Mariposa Technology, Inc · NORTEL NETWORKS™ How the world shares ideas. · Sprint · VISUAL NETWORKS.

EXHIBITING SPONSORS:

Eastern Research

If you are interested in presenting and exhibiting sponsorship opportunities, please contact Andrea D'Amato at (508) 820-7520 or adamato@nww.com

Cool Tools

Quick takes on high-tech toys

Lee Schlesinger, Test Center director

From paper to the Web

When you create documents on a PC, moving them to a Web site is no great feat. But you have fewer options when your documents arrive in the mail — and I don't mean e-mail.

But the process need not be a nightmare any longer. Caere has taken its OmniPage optical character recognition (OCR) product and extended it to create OmniPage Web, an application that walks you through the entire process of scanning, OCR and proofing multiple printed pages. OmniPage Web creates a set of Web pages from printed information, complete with navigation buttons, table of contents and even a common look and feel if you want one.

OmniPage Web succeeds because of the quality of its text recognition and proofing tools. I took our corporate training catalog and scanned the first few pages. OmniPage recognized most of the common words. When it didn't recognize a name or an abbreviation, OmniPage Web asked if it should change the word and proposed possible substitutes. OmniPage Web automatically skips from one unrecognized word to the next, making the whole process smooth and quick.

When the recognition is complete, the program displays all the scanned pages on the left side of the screen and an HTML page image on the right side. In the middle is a proofing panel that lets you make changes to the pages. The program is intelligent enough to recognize headings in the document and apply them as HTML code. It also recognizes hyperlinks and e-mail addresses in a document and creates appropriate HTML tags.

The software can put links to images of the original pages into your HTML text. OmniPage Web cleverly turns the scanned page into an image map; you can click on it to be transported to the corresponding point in the HTML document. This is a handy navigation feature for viewers familiar with the original paper format.

OmniPage Web is a great timesaver, but it's not perfect. It doesn't do well recognizing text printed over a variable background, such as a logo or a photo. It had trouble with the bullets in front of some of the lines in my test documents. And the color and button themes it applies to pages are, for the most part, dreadful.

Still, if you have a large amount of information on paper that you want to move to the Web as quickly as possible, no software makes the process smoother than OmniPage Web. ◩

Net Results

Coolness Meter

OmniPage Web
Caere
(408) 395-7000, www.caere.com/products/omnipage/web/
$499
Bottom line: *A competent tool for converting printed pages into Web content.*

Eight branch offices.

Need high-performance application access.

Over 95 concurrent users.

Small Biz

No sweat.

With Citrix server-based computing solutions, you can deliver faster application performance for more remote users without upgrading your network.

Right now, Citrix® MetaFrame™ and WinFrame® server-based computing software is being used by thousands of companies to ensure their various users throughout the enterprise get lightning-fast access to the latest Windows®-based applications.

10x faster application performance over your existing remote connections.

Optimized for network connections as low as 14.4 Kbps, Citrix software enables IT professionals to deliver up to 10x faster response over existing remote-node servers and branch-office routers. This way, every remote user can get LAN-like performance, even with 32-bit applications, regardless of whether they're using analog or ISDN modems, WANs, wireless LANs or the Internet.

Reduce network traffic and increase application availability for more users.

Since all processing is done at the server, your vital applications consume as little as one-tenth of their normal network bandwidth. This level of efficiency means that administrators can increase the number of concurrent users working with a specific application to keep productivity levels high.

See what 77% of Fortune 100 companies already know—Citrix works!

Discover today how thousands of leading organizations are using Citrix MetaFrame and WinFrame to improve their remote application performance for more users. All without breaking a sweat.

To learn more about how Citrix can help you, call 888-564-7630 or visit us on the Web at www.citrix.com/drive3 for a FREE Test Drive CD-ROM.

CITRIX®

Management Strategies

Career Development, Project Management, Business Justification

Taking inventory

Skills assessment can help you hire the right people the first time and make the best use of your staff.

BY LISA MORGAN

ICG Communications needs to hire five WAN administrators, but Kael Loftus would be happy to find just one. The network operations center (NOC) team recently hired an administrator who had an impressive resumé and did well in a technical interview, but who failed on the job.

Loftus and his fellow NOC managers at ICG's San Jose division realize the results of the interviews they conduct may not necessarily be indicative of performance, so they are developing a standardized written test to administer to job candidates.

The test is all about skills assessment, a burgeoning category of tools and practices. Assessing employees' skills will help companies:

- Hire the right people the first time.
- Compare their employees' skills.
- Spend IT training dollars more wisely.
- Deploy skills-based project teams.

In its most basic form, skills assessment reflects traditional human resources and management practices, such as reviewing resumés, conducting interviews and monitoring employee performance. Today, though, companies are developing their own methods — or buying third-party tools — to more accurately gauge the skill sets of job applicants, consultants, employees and teams.

Talking technology

ICG (formerly Netcom) knows that resumés and employment interviews don't tell the whole story about an individual's skills, so the company also relies on technical interviews to assess aptitude and knowledge.

ICG managers spend 1 to 2 hours asking candidates about everything from the basics of the Open Systems Interconnection model to the functional differences between the Border Gateway Protocol and the Open Shortest Path First protocol. The length and depth of an interview are scaled according to the candidate's background. The forthcoming written tests will be used as another skills assessment tool.

Other companies are embracing even more formalized skills assessment programs for recruiting, training and the creation of project teams.

For example, Don Harris, staff development manager at Belks Department Stores in Charlotte, N.C., says his firm decided several years ago to capitalize on its employees' skills. The retailer tried to create an inventory of workers' skills, but there was no quick way to navigate through the paper-based system whenever a specific need arose. "We ended up with too many useless forms," Harris says.

Harris then turned to SkillView, a suite of client-server and Internet-based skills assessment tools that lets employees profile themselves. SkillView allows the company to identify skills gaps, training needs and proficiency levels of job applicants and employees. As a result, Belks is getting more out of its training budget and is now in a position to implement skill-based staffing.

GE Capital Consulting is another company that recognizes the value of skills assessment.

"In the past, we found that some individuals interviewed well but were no good on the job. Over time, we realized we needed an unbiased, standardized method," says Wanda Brooks, recruiting director at the St. Paul, Minn., consultancy.

The IT consulting firm still conducts interviews and reviews resumés, but hiring managers also use self-assessment forms and TeckChek, a skills assessment tool designed to pinpoint strengths and weaknesses in more than 100 IT areas, including NetWare, Windows NT and Lotus Notes administration.

Kael Loftus of ICG Communications plans to administer written tests to job candidates to get a better indication of their aptitude.

JASON GROW

TeckChek evaluations are administered in a monitored environment, which usually consists of one or more computers, one or more test takers and an administrator. TeckChek proficiency profiles include seven raw scores, percentiles that compare the test taker to others and a detailed list of strengths and weaknesses. GE Capital Consulting uses the data to select the most qualified workers for client projects and to build skill-based teams.

"Vendor certification isn't enough," Brooks says. "Someone once applied who had been through five popular certification programs. This person looked great on paper but scored 1% on the TeckChek evaluation."

While vendor certification enhances an employee's qualifications, it doesn't provide an accurate measure of skills because each worker's knowledge base and experience is different.

Skills assessment may become an integral part of human resources practices, training and IT project management as a means of streamlining resources. In the meantime, ICG's Loftus says: "We haven't found a replacement for the good old-fashioned test drive."

Morgan is a freelance writer and consultant in Palo Alto. She can be reached at lisamorgan@mindspring.com.

Getting the most from skills assessment

Your network department may be able to benefit from skills assessment in the following ways:

RECRUITING: Formalized testing can provide a more accurate representation of individuals' skill sets, allowing you to better match workers to projects or job openings.

COMPARATIVE ANALYSIS: Use skills assessment data to compare workers' skills against each other, in relation to a norm, or in relation to a group.

TRAINING: Skills assessment can help you better align training programs with employees' skills deficiencies.

ASSEMBLING TEAMS: Increasingly, companies are beginning to form task forces or teams based on skill sets, rather than departmental domains. Using a skills repository, you could form a team on the basis of specific expertise.

Online • **Information about skills assessment tools.** www.nwfusion.com FIND IT 2529 ON FUSION

Networking Careers

Systems Analyst II (ID #8042104): Develop and maintain computer programs for Claims System using COBOL and IMS-Online. Responsible for design, development, and maintenance of LOTUS NOTES applications in a client-server environment. Bachelor's degree (or equivalent) in Computer Science or similar major required, as is two years of experience in the job offered or in a programming position. Prior experience must include use of COBOL. 40 hrs./wk. 8:15 am - 4:45 pm. $48,820 yr. Successful applicants must be able to perform job duties on date of application and must be presently eligible for permanent employment in the United States. Send resumes with Soc. Sec. Nos. to the Indiana Department of Workforce Development, 10 N. Senate Ave., Indianapolis, IN 46204-2277. Attention: Mr. Gene R. Replogle.

A position is available for a Software Engineer with an Atlanta-based software development company. The position involves design and development of object-oriented software for the World Wide Web including object oriented web application development utilizing Web Objects, object-oriented business data modeling and database application development utilizing Enterprise Objects Framework and similar technologies. Candidates for this position should possess a Master's degree in Computer Science and three years' experience in object-oriented web applications development with Web Objects object-oriented business data modeling, and database application development with Enterprise Objects Framework. Fax resume to 404-467-9179.

Senior Network Engineer
Responsible for the design and implementation of WAN's, 5 to 7 years experience in the installotion ond configuration of Cisco or Bay Network Routers. Hands an experience with routing protocols such os: RIP, OSPF, BGP, IGRP/EIGRP. Four year degree required. Certifications are a plus. Submit resume to: Network Recruiter, Pencom Systems; 40 Fulton Street; New York, NY 10038; Fax 212-227-1854 or email: hireme@pencom.com.

Feedback

Have an idea for a Networking Careers article?

Send your comments, ideas, and suggestions to ccapp@nww.com

Twenty years from now we'll be putting families in space. What will you be doing? *Apply online at www.boeing.com/employment or send resumes to The Boeing Company, PO BOX 3707, M/C 6H-PR, 003692 Seattle, WA 98124-2207.*

It is the policy of The Boeing Company to attract and retain the best qualified people available without regard to race, color, religion, national origin, gender, sexual orientation, age, disability, or status as a disabled or Vietnam-era veteran.

Data Services

one of the COMPUTERWORLD BEST PLACES TO WORK 98

These positions are part of a nationally deployed Data Services Engineering team responsible for providing Tier 2/3 technical consultative support.

Technical Sales Support Engineer
Nationwide Openings

You will be called upon to:

- Assist sales teams and customers in assessing customer application requirements and developing short-term and long-term data networking solutions.
- Perform pre-sale technical assurance of data networking solutions.
- Provide feedback to Product Mngmt/Mktg on data networking needs of market/customers.
- Conduct knowledge transfer programs to field sales force.

The professional we seek will possess demonstrated knowledge of data networking solution design including:

- 5+ years exp. in pre-sale technical sales support or equivalent.
- WAN (e.g.,TDM,SONET,FR,ATM,IP) and LAN technologies.
- Data networking equip (e.g.,CSU/DSUs,routers, switches, firewalls).
- Internet, intranet, and extranet solutions (e.g.,VPDN,CIDR,DNS,SMTP).
- Protocols (e.g.,FR,ATM,TCP/IP,IPX,SNA,etc.).
- Strong PC, interpersonal, and presentation skills.
- BSEE, BSCS, or equivalent degree pref.

Senior Data Engineer
Rochester, NY

You will be called upon to:

- Establish and maintain the data network architecture.
- Deployment of national Frame Relay/ATM infrastructure.
- Certification/testing of network devices.
- Capacity planning.
- Pre-sales support as required.
- Research and design new products and services.
- Development and documentation of engineering standards.

Required experience and specific competencies:

- At least 6 years of diverse data communications engineering experience of ATM/Frame Relay/IP Router networks.
- Proven track record of accomplishments.
- Good oral and written communication skills.
- Project management skills.
- Frame Relay/ATM network standards & design concepts.
- LAN protocols : RID, OSPF, IGRP, BGP, PNNI, B-ICI.
- Signaling: ATM/Frames UNI, Q.931, SS7, CAS.
- Management protocols: SNMP.
- Ethernet (10BaseT, 100BaseT), Token Ring, H99I.
- Circuits: T-1, T-3, Fractional T-1, ISDN, SDH Hierarchy, SONET, DWDM.
- Network analyzers: NG Sniffer, ATM/Frame analyzer.
- OS: DOS, Windows/95/98, Unix/SUN Solaris

Additional background in the following is highly desirable:

- International network design/implementation.
- Voice over IP design implementation

For immediate consideration, send/fax resume to: Corporate Staffing-ML, Frontier Communications, 180 South Clinton Ave., Rochester, NY 14646; Fax: 800-676-3728; Email: resume_administrator@frontiercorp.com We value diversity in the workplace. EOE.

frontier COMMUNICATIONS srn

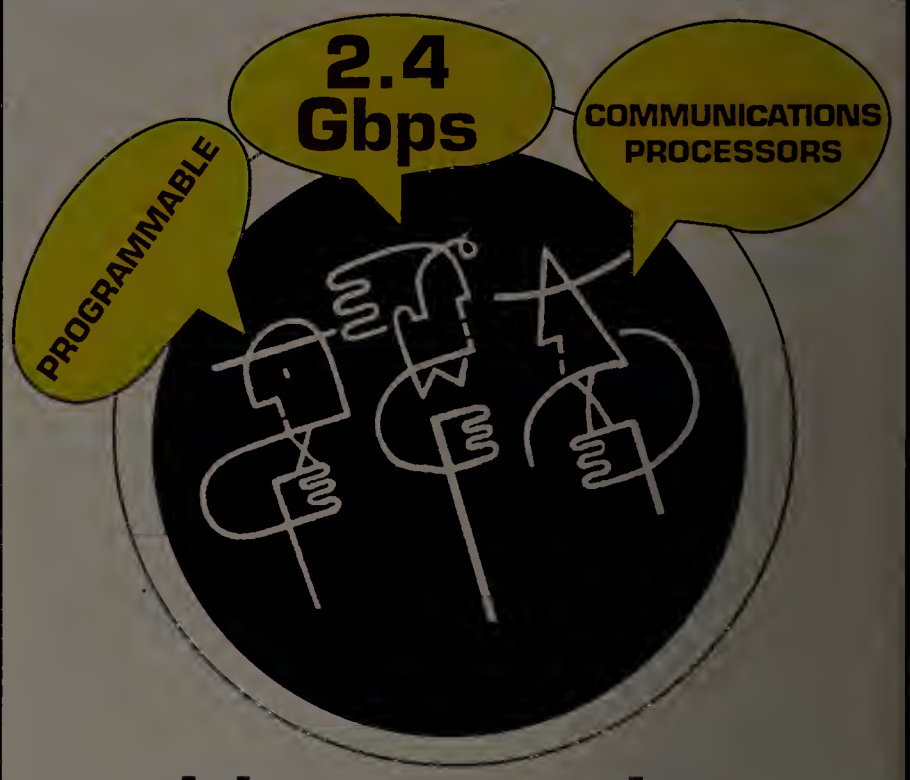
www.frontiercorp.com

Our Signature Series issues, published bimonthly, provide insights, opinions and information on the most important issues shaping the networked world. The award-winning Signature Series issues include:

THE NetworkWorld Signature SERIES

The 200 Issue *4/26/99*	**The You Issue** *Showcasing the Network Leaders: 7/26/99*	**The Buzz Issue** *9/27/99*	**The Best Issue** *11/15/99*

Got Hiring Needs? Talk to Network World
800-622-1108 Ext. 7510



it's no wonder people are talking

Maker Communications is a provider of communications processing technology - semiconductor Integrated Circuits (ICs) and software. We focus on High-Intensity (high bandwidth or compute-intensive) applications which require leading-edge communications processing technology. Our customers are data communications and telecommunications equipment vendors who keep pace with changing market requirements, reduce their time-to-market and lower their system costs using Maker's products.

We're the place everyone's talking about when it comes to outstanding careers. Whether it's our outstanding technology or the diversity of products, Maker is a place that has everyone talking.

High intensity communications processing™ - with speeds up to 2.4 Gbps and Custom Programmability

- **Hardware Manager**
- **TCP/IP Architect**
- **CPI Manager**
- **Senior Software Engineers**
- **ASIC Designers**
- **Senior Design Verification Engineers**
- **Co-Verification Tools Engineer**
- **Sales Managers, Major Accounts - Eastern and Western Regions***
- **Field Applications Architects - Eastern and Western Regions***
- **Systems Engineers**
- **Quality Engineer**
- **IT Manager**

Positions in MA and CA

For detailed job descriptions, please visit our Web site at www.maker.com. Maker Communications, Inc., offers a salary and benefits package designed to reward the industry's best talent. For immediate consideration, please forward your resume to: Maker Communications, Inc., 73 Mount Wayte Avenue, Framingham, MA 01702; fax: (508) 628-0256; e-mail: resume@maker.com EOE

MAKER COMMUNICATIONS, INC

www.maker.com

Rocket Your Career With our Free Self-Study Course!

Call Now to Get Your First Course at No Charge! (Limited Time Offer)

Discover the fast and easy way to increase your I.T. knowledge and prepare for I.T certification. Our computer-based training courses provide a learning environment that surpasses traditional classroom and video courses. See for yourself how ForeFront Direct can give you the skills you need to launch or accelerate your I.T. career. Call today for your FREE I.T. Training Course!

- **Open the Door to Great Career Opportunities**
- **Raise Your Income**
- **Gain Valuable Skills, Knowledge and Technical Recognition**
- **Study at Your Own Pace**
- **Interactive Hands-on Exercises**
- **Online and Telephone Mentoring Available**
- **One-on-One Training Consulting**

Self-Study Courses :

- MCSE
- MCSE+Internet
- MCP
- CNE
- Novell CIP
- CNA
- Oracle
- Lotus
- Web Master
- PC Repair
- A+
- MCSD
- Visual Basic
- Visual C++
- Java
- C++
- Cisco
- UNIX
- Networking
- Office 97
- Windows 98
- And More!

Call Now to Get Your FREE Self Study Course!

FOREFRONT™ DIRECT
A CBT Group Company

Toll Free **1-877-TRAINING**

1-877-872-4646

www.techcourses.com

FOREFRONT™ DIRECT
A CBT Group Company

(800)475-5831 • (727)724-8994
Fax: (727)726-6922

ON-LINE PRICING AND ORDERING SERVICE

info@telcoexchange.com

Check availability...
nationwide

Compare prices...
multiple tariffs

Order digital service...
fast and secure

On the web...
24 x 7

t1-t3

dsl

isdn

frame relay

internet services

network solutions

877.988.6484

TELCO EXCHANGE™

www.telcoexchange.com

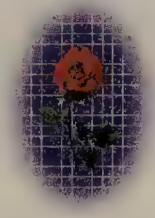
MANAGE 1,000 SERVERS
from 4 or more KVM stations

Celebrating our 15 Year Anniversary

Rose has done it again! The UltraMatrix is a keyboard-video-mouse (KVM) switch that has all the features, is the simplest to use, and costs the least.

- Simultaneous access from 4 or more KVM stations
- Supports multiple platforms: PC, Sun, Unix, others
- Full keyboard and mouse emulation for automatic booting
- Expands easily with plug-in cards
- Sleek on-screen display simplifies user interface
- Innovative cabling system makes installation clean and easy
- Uses less rack space than other switches
- Security, access groups, user profiles, status screen, flash memory, and more

Rose has been providing innovative solutions since 1984. We have a complete line of KVM switches for server rooms, classrooms, desktops, and other uses. Ask us about our KVM extenders using coax or twisted pair. We also have an extensive line of serial and parallel data switches. Call us today to discuss your application.



GROW WITH ROSE PRODUCTS

USA OFFICE: 10707 STANCLIFF ROAD HOUSTON, TEXAS 77099 PHONE 281-933-7673 FAX 281-933-0044
UK OFFICE: PHONE +44 (0) 1264 850574 FAX +44 (0) 1264 850529

Call 800-333-9343 for your catalog

ROSE ELECTRONICS

WWW.ROSEL.COM

Coming Up in May

Issue Date		Close
May 3	Tests/Reviews: Diagramming software with autodiscovery. Aditi Talisma.	Apr. 21
May 10	Tests/Reviews: VPN site-to-site buyer's guide. Norton HelpDesk Assistant.	Apr. 28
	Bonus Distribution: NetWorld+Interop, Las Vegas	
May 17	Tests/Reviews: Linux vs. NT. Remote access - NT RAS+board vs. dedicated RAS.	May 5
May 24	Tests/Reviews: Inventory/asset management software. Network simulation modeling tools.	May 12
May 31	Test/Review: Collaboration - servers.	May 19

To reserve your ad space in Network World's MarketPlace call 1-800-622-1108 ext. 7507

Please note that technology updates, and comparative and single product review dates and topics are subject to change without notice.

MarketPlace

TRAINING DIRECTORY

NetworkWorld

EDITORIAL INDEX

ADVERTISER INDEX

Network World Fusion – www.nwfusion.com

3COM	IBM
3M-Telecom Systems Division/Volition	Larscom Incorporated
ADC Kentrox	Make Systems
Adaptec, Inc.	MCI
Allot Communications	NetSolve
Ascend Communications	Nortel
AXENT Technologies	Ripple Technology
Cisco Systems	Shiva
Compaq	Sterling Software
Compatible Systems Corporation	VeriSign
Dell Computer Corporation	Visual Networks
F5 Labs	Wavespan
Foundry Networks, Inc.	WinNet MCS
Intraware	Xircom

These indexes are provided as a reader service. Although every effort has been made to make them as complete as possible, the publication does not assume liability for errors or omissions.

*Indicates Regional/Demographic

Network World, Inc.

Colin Unigaro, President/CEO
Eynee Thibeault, Senior Vice President/Publisher
Mary Kaye Newton, Assistant to the President
Eleni Brisbois, Senior Sales Associate

FINANCE
Mary Fanning, Vice President Finance
Paul Mercer, Finance Manager

HUMAN RESOURCES/ADMINISTRATION
Monica Brunaccini, VP of Human Resources/Admin.
Danielle Caldwell, Sr. Human Resources Representative
Frank Coelho, Office Services Manager
Lisa Smith, Telecommunications/HR Coordinator
Tom Garvey, Mailroom Supervisor
Mark Anderson, Mailroom Assistant

MARKETING
Hillary Freeley, Director of Marketing
Jim Grisanzio, Public Relations Manager
Kristin Wattu, Marketing Communications Manager
Barbara Sullivan, Sr. Marketing Research Analyst
Donna Kirkey, Marketing Design Manager
Judy Schultz, Graphic Designer/Marketing Specialist
Cindy Panzera, Marketing Specialist

GLOBAL PRODUCT SUPPORT CENTER
Nancy Parquette, Event Planner

ADVERTISING OPERATIONS
Karen Lincoln, Director of Advertising Operations
Ann Jordan, Supervisor of Advertising Operations
Kris Guay, Direct Response/Recruitment Ad Coordinator

PRODUCTION
Ann Finn, Production Director
Greg Morgan, Senior Production Supervisor
Marlo Matoska, Print Buying Supervisor

CIRCULATION
Sharon Smith, Senior Director of Circulation
Richard Priante, Director of Circulation
Christine Rhoder, Circulation Marketing Manager
Bobbie Cruse, Subscriptions Manager
Mary McIntire, Circulation Coordinator

RESEARCH
Ann MacKay, Research Director

DISTRIBUTION
Bob Wescott, Distribution Manager/(508)879-0700

IDG LIST RENTAL SERVICES
Elizabeth Tyle, Sales Representative
P.O. Box 9151, Framingham, MA 01701-9151
(800) 343-6474/(508) 370-0825, FAX:(508) 370-0020

PROFESSIONAL DEVELOPMENT GROUP
William Reinstein, Senior V.P./Business Development
Steven Engel, General Manager Seminars & Events
Andrea D'Amato, Sales Manager/Strategic Partnerships
Debra Becker, Senior Marketing Manager
Christie Combs, Finance/Operations Manager
Peter Halliday, Product Manager/NetDraw
William Bernardi, Senior Event Planner
Maureen Whiting, Senior Marketing Specialist
Kristin Ballou, Account Executive
Betty Amaro, Finance/Operations Analyst
Jill Keaveney, Event Planner
Tim DeMeo, Customer Service Representative
Tricia Fiscale, Sales Assistant

ONLINE SERVICES
Ann Roskey, Director, Online Services
Jean-Olivier Holingue, Director of Technology
Clare O'Brien, Online Sales Manager
Dan Chupka, Online Account Executive
Pam Kerensky, Online Database Manager
Andrea Duksta, Senior Web Producer
Karen Avedian, Sales Operations Analyst
Jolene Springfield, Sales Operations Analyst
Christine Rhoder, Circulation Marketing Manager
Nadar Fakhraie, Web Engineer
FAX:(508) 270-8869

INFORMATION SYSTEMS/IMAGING SERVICES
Michael Draper, Vice President Information Systems
Rocco Bortone, Network Manager
Kevin D'Keefe, Systems Manager
John Chambers, Groupware Technologist
Anne Nickinello, Senior Manager, Imaging Services
Deborah Vozikis, Senior Imaging Specialist
Sean Landry, Imaging Specialist

IDG

Patrick J. McGovern, Chairman of the Board
Kelly Conlin, President
Jim Casella, Chief Operating Officer

Network World is a publication of IDG, the world's largest publisher of computer-related information and the leading global provider of information services on information technology. IDG publishes over 275 computer publications in 75 countries. Ninety million people read one or more IDG publications each month. *Network World* contributes to the IDG News Service, offering the latest on domestic and international computer news.

Sales Offices

Carol Lasker, Associate Publisher
Internet: clasker@nww.com
Debbie Lovell, Senior Sales Associate
(508) 875-6400/FAX:(508)879-5760

NEW YORK/NEW JERSEY
Tom Davis, Advertising Director/Eastern Region
Elisa Della Rocco, District Manager
Internet: tdavis, elisas@nww.com
Aimee Jacobs, Sales Assistant
(201) 587-0090/FAX: (201) 712-9786

NORTHEAST
Donna Pomponi, Senior District Manager
Kevin Gasper, District Manager
Michael Eadie, Account Executive
Internet: dpomponi, kgasper, meadie@nww.com
Linda Bishop, Sales Assistant
(508) 875-6400/FAX: (508) 879-5760

MID-ATLANTIC
Jacqui DiBianca, Senior District Manager
James Kalbach, Account Executive
Internet: jdibian, jkalbach@nww.com
Rebecca Showers, Sales Assistant
(610) 971-1530/FAX: (610) 975-0837

MIDWEST/MARYLAND
Eric Danetz, District Manager
Aimee Jacobs, Sales Assistant
(201) 587-0090/FAX: (201) 712-9786

CENTRAL
Dan Gentile, Midwest Regional Manager
Internet: dgentile@nww.com
Kristin Ashton, Sales Assistant
(512) 249-2200/FAX: (512) 249-2202

NORTHWEST
Sandra Kupiec, Advertising Director/Western Region
Carol Stiglic, Senior District Manager
Susan Rastellini, Sr. District Manager
Karen Weiss, Sr. District Manager
Lara Greenberg, District Manager
Internet: skupiec, cstiglic, slr, kweiss, lgreenbe,kmarceau@nww.com
Katherine Marceau, Sales Operations Manager
Javiera Garcia, Sales Assistant
Mark Hiatt, Sales Assistant
(408) 567-4156/FAX: (408) 557-4156

SOUTHWEST
Amy C. Bartulis, Senior District Manager
Internet: ebartuli@nww.com
Becky Bogart, Account Executive
(949) 250-3006/FAX: (949) 833-2857

SOUTHEAST
Don Seay, Senior District Manager
Internet: dseay@nww.com
Terry Sanders-Prentice, Sales Assistant
(770) 394-0758/FAX: (770) 394-6354

DIRECT RESPONSE ADVERTISING
Response Card Decks/Marketplace
Kim Norton, Director of Direct Response
Richard Black, Sr. Account Manager
Enku Gubaie, Account Manager
Sean Weglage, Account Manager
Kathryn Zinn, Account Manager
Internet: knorton, rblack, egubaie, sweglage, kzinn@nww.com
Sharon Chin, Sales/Marketing Operations Manager
Chris Gibney, Sales Assistant
(508) 875-6400/FAX: (508) 628-3976

RECRUITMENT ADVERTISING
Dodi Rabinovitz, Senior Recruitment Director
Carla Cappucci, Marketing/Sales Coordinator
Sandy Weill, Account Executive
Karima Zannotti, Account Executive
Internet: drabinov, ccapp, sweill, kzannott@nww.com
(508) 875-6400/FAX: (508) 820-0607

Article Reprints

from

The newsweekly of enterprise network computing

NetworkWorld

High impact article reprints from NetworkWorld can help your company in many ways:

- Reprints can increase EXPOSURE for your product or service.
- Reprints are unique and unbiased — they pack CREDIBILITY!
- Reprints make great SALES tools for trade shows, mailings, or media kits.

Special Offer — Ends April 27!

Take advantage of our special NetWorld+Interop reprint offer: Place your NetworkWorld reprint order by April 27, 1999 and we'll increase the quantity you order by 10% FOR FREE. And we guarantee delivery by May 7, 1999!

FOR MORE INFORMATION CALL:

RMS
REPRINT MANAGEMENT SERVICES

Ray Trynovich or **Mike Shober** at
717.560.2001

147 WEST AIRPORT ROAD • PO BOX 5363
LANCASTER PA 17606-5363
FAX: 717.560.2063
website: http://www.rmsreprints.com
email: sales@rmsreprints.com

NetworkWorld
THE LEADER IN NETWORK KNOWLEDGE
Print • Online • Events
AN IDG COMPANY

OpenView,
continued from page 1

Universe conference, amid a slew of announcements of new management software products and releases directed at the 2,500 attendees. The products include a policy-based management application and response-time measurement software.

HP has built many products to address different areas of management, but the products traditionally have had inconsistent interfaces and haven't shared data as much as they could have, acknowledges Olivier Helleboid, general manager of HP's OpenView software business unit.

That will start to change late this year. Upcoming releases of HP's various management products will have a consistent look and feel. They will share a common event browser, for example, and they will have a user interface similar in layout to Microsoft's Outlook software, HP executives say.

"That's definitely something that HP needs," says Matt Mahannah, systems engineer at Workstations International, a Minneapolis-based network integration and management company.

Once the user interface is consistent across operating systems and management applications, managers will have to learn only one way of navigating through HP software. And sharing management data among systems, networks and applications should let managers get a better picture of how effectively an enterprise's end users are getting to the resources they need.

HP will also work the Common Information Model (CIM) into future releases to allow the company's applications to share data more easily. CIM is a standard under development by the Desktop Management Task Force to provide a way for software to exchange management information. While CIM is intended to help different vendors' applications talk to each other, HP is using CIM in its own product line as a unifying mechanism. Helleboid says this change won't be visible to users.

HP has taken a somewhat different path in terms of product development than competitors Computer Associates and Tivoli Systems. HP has developed products to fit specific needs, while CA and Tivoli fit their products into an overall framework.

All three companies integrate systems and network management, but HP hasn't had the same consistent look across individual products.

So far, many users have been content with the separateness of HP's products.

"We tend to stay in our silos," says Mark Atkins, systems manager for Indianapolis-based pharmaceutical company Eli Lilly & Co. Systems and network managers have traditionally stayed apart, he says.

Integration a must

But as the wall between those two disciplines erodes, there will be a need to unify the products, says Jeff Case, chief technical officer of SNMP Research in Knoxville, Tenn. "HP has a long list of products, and the only two things they have in common are that all the developers report to Olivier [Helleboid], and they all contain the name OpenView," he says.

At the same time, HP is bundling its software to address specific IT elements. OpenView Manager for SAP R/3, announced last week, combines HP's Network Node Manager (NNM) 6.1 network management platform with the company's IT/Operations systems management, PerfView performance management and SAP-specific plug-ins.

The package has a set price, depending on the number of users. The package costs $50,000 for 100 users, for example.

Next month HP will introduce a similar product tailored to storage-area networks, combining network management, storage management and links to storage products from EMC and StorageTek.

Product parade

Products announced at last week's show address these areas:

- Policy-based management. HP is dipping its toe into this area with OpenView PolicyXpert, which lets users set up different classes of service for network traffic. Future versions will expand to include security, HP executives say.

PolicyXpert uses the Common Open Policy Services standard currently under development in the IETF to communicate policies to network hardware.

The initial version of PolicyXpert will run on Windows NT and work with high-end routers from Cisco, Hitachi and Intel; LAN switches that include Lucent's Cajun series and HP's ProCurve; Intel network interface cards; HP-UX servers; and Packeteer's traffic shaper.

- Software distribution. HP is enhancing its Desktop Administrator (DTA) product with a "publish and subscribe" method of distributing software to desktop PCs. End users can choose what applications they want installed, and DTA 5.0 will send them updates on those applications when they become available.

- Network management. Version 6.1 of HP's flagship NNM adds management for Cisco Catalyst switches. The software can now detect how the switches are connected, which devices are attached and which virtual LANs are configured.

In addition, the software now has 13 canned reports, so managers can graph router availability, CPU utilization, top talkers and other metrics.

- Response time measurement. HP's new Response Time Workbench is a software tool kit for developing modules that measure the response time of applications from an end user's perspective. ◪

Across the board

HP last week introduced and enhanced software across its OpenView systems and network management product lines.

Product	Price	Available
Network Node Manager 6.1	Starts at $4,995	Summer
PolicyXpert	$21,500	Summer
Desktop Administrator 5.0	Not available	Q3
IT Service Manager 5.6	Pricing varies	June
Response Time Workbench	$100,000	April
Manager for SAP R/3	$50,000 for 100 seats	April

TSE,
continued from page 12

"Profcssionals shouldn't have to be forced to work around artificial blocks to solve a problem."

Microsoft needs to train more support staff, users say. "They are very weak in TSE support," says William Botti, president of Computer Networks, Inc. of Pleasanton, Calif. "Citrix trained Microsoft guys. And if you get the right guy, you're all right. But they are not very deep in the field."

Whittle says Microsoft treats TSE as an NT 4.0 product, and the entire NT product support team is expected to be familiar with the thin-client technology. "That's obviously a process of building that team up, as with any new product," she says. "We're not hearing complaints from our customers or our channel that product support is a huge problem." The NT support staff is now being trained in Windows 2000 and its built-in terminal services.

"Microsoft is not an integrator," says Sid Herron, sales manager at Moose Logic, a Citrix reseller and Microsoft Certified Solutions Provider. "Part of the Microsoft culture seems to be a strong belief that Microsoft's customers don't need anyone but Microsoft to make Microsoft products work. They don't direct their customers to the people who are in the best position to implement the technology, namely, the existing Citrix resellers."

That's only partly true, Whittle says. Microsoft initially focused its TSE marketing efforts on very large corporate customers.

To support these customers, Microsoft first worked with a small group of big integrators, such as EDS. By contrast, she says, Citrix resellers typically have focused on mid-size and small customers, or on departmental installations for larger ones.

Whittle says Microsoft has encouraged big integrators to work with Citrix resellers. In addition, she says, Microsoft is expanding its focus to the lower end of the market. Whittle says letters will be mailed shortly to resellers and integrators, alerting them to new support programs that will be launched in the next 30 days. ◪

Network World, 161 Worcester Road, Framingham, Mass. 01701-9172, (508) 875-6400

Periodicals postage paid at Framingham, Mass., and additional mailing offices. Posted under Canadian International Publication agreement #0385662. *Network World* (ISSN 0887-7661) is published weekly, except for a single combined issue for the last week in December and the first week in January by *Network World*, Inc., 161 Worcester Road, Framingham, Mass. 01701-9172.

Network World is distributed free of charge in the U.S. to qualified management or professionals.

To apply for a free subscription, complete and sign the qualification card in this issue or write *Network World* at the address below. No subscriptions accepted without complete identification of subscriber's name, job function, company or organization. Based on the information supplied, the publisher reserves the right to reject non-qualified requests. Subscriptions: 1-508-820-7444.

Nonqualified subscribers: $5.00 a copy; U.S. - $129 a year (except Washington, DC, $136.74); Canada - $160.50 (including 7% GST, GST#126659952); Central & South America - $150 a year (surface mail); Europe - $205 a year (surface mail), all other countries - $300 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Please include mailing label from front cover of the publication.

Network World can be purchased on 35mm microfilm through University Microfilm Int., Periodical Entry Dept., 300 Zebb Road, Ann Arbor, Mich. 48106.

POSTMASTER: Send Chenge of Address to *Network World*, P.O. Box 3090, Northbrook, IL 60065.

BPA INTERNATIONAL BPA WORLDWIDE

USPS735-730

Start-ups,
continued from page 1

edge switches, routers and WAN access devices. The new chips, if adopted, could:

- Help new technologies get to market faster.
- Speed up and simplify network equipment design to allow start-ups to jump into markets more cheaply.
- Let network managers eventually design upgrades to their own devices.

Fueled by innovations in microprocessor design, network device function is being separated from the underlying transport engine. Instead of designing custom Application Specific Integrated Circuits (ASIC) for each switch, router or WAN access device, vendors will soon be able to choose a generic microprocessor optimized for network duties, and then write application software that tells the device what kind of network chores to do, just as Microsoft Word gets a Pentium to do its bidding.

"By next year, three guys in a garage will be able to build a Layer 3 terabit backbone router by buying merchant silicon and writing software, and the box will be as fast and as cheap as an ASIC-based product," says David Husack, chief technology officer at C-Port, one of the new microprocessor companies.

Right now, each network device has a custom-built processor that enables it to move and interpret datastreams. A processor's life cycle, therefore, is only as long as the device's. The next time a new switch or router is designed, a new processor has to be designed along with the box.

With the new wave of processors, the only component that changes from product to product is the software. Furthermore, the application code is assembled from reusable bits. That ability means you can pick and choose functions from a code library; for instance, take Gigabit Ethernet code, add an 802.1d bridge, mix in some server load-balancing code, and you wind up with a switch.

The new processors are more flexible than ASICs because the code can be fixed, upgraded or replaced at any time. By contrast, ASIC code is baked in and can't be changed. The new processors are also faster than code wrapped around a generic CPU, because the engine is optimized for network functions, the vendors claim.

The microprocessor architecture is designed to move bits at wire-speed, whether they're Ethernet frames or ATM cells. The accompanying software will determine what layer to look at, and what to do with the information collected as the stream goes by.

The ultimate value to the end user will be shorter product development cycles because vendors can reuse code. There will also be longer product life cycles because new software can be added to adapt to changes in standards and to take advantage of industry advances.

"Eventually, the goal is to give network managers the ability to program the services themselves," says Ford Tamer, Agere's CEO.

In addition to upgrading the devices via software, processors can also be swapped out — without changing the device itself. For example, if this technology had been available when Gigabit Ethernet became a standard, end users could simply have downloaded new software onto existing 10/100M bit/sec switches and routers. The older equipment wouldn't have become obsolete.

With major vendors signing on with C-Port and Agere, and chips about to ship, end users can expect to see new switches, routers and WAN access devices by year-end, some claim.

"The change is going to happen first at the high-end," predicts John Freeman, an analyst at Current Analysis.

Agere will make an official announcement on May 3 about products, and possibly about deals with some large network vendors, too.

The new chips will be measured by the speed by which the optics can transport datastreams, from OC-12 (622M bit/sec) to OC-48 (2.4G bit/sec). In this case, OC-12 and OC-48 do not refer to an ATM network.

While sources say C-Port has already signed some major network vendors, the company won't confirm or deny any deals or release product information.

Cabletron expects to ship network devices integrating the new products by year-end. A Cabletron spokesperson says the company is evaluating several vendors, but the company seems interested in C-Port.

C-Port and Agere will have booths in Start-Up City at NetWorld+Interop 99 in May. ◪

PROFILE: AGERE

STARTUP COMPANY

Headquarters:	Austin, Texas
Founded:	June 1998
Primary business:	Programmable multiprotocol processors for very fast switches and routers.
Funding:	$8 million from Austin Ventures, TL Ventures
Management:	Chairman Robert Fabbio, CEO Ford Tamer, Chief Scientist and Co founder Victor Bennett, CTO Eric Rothfus
Employees:	33
Fun fact:	The company jokes about forcing job candidates to take on CTO Rothfus at pinball. Rothfus, the office champ, can often be seen formulating new circuit designs while playing "The Machine: Pride of PinBot," which sits in the game room beside a multiprotocol video arcade machine.

DSL,
continued from page 1

the SuperCom trade show in Atlanta.

But some vendors say they will not participate in the event. They worry that even if current modems succeed in communicating with each other, the gear still may not be able to swap data at a full 1.5M bit/sec download speed and may lack management features carriers need to offer DSL services.

DSL vendor Paradyne will skip the demonstration because it won't be worth the frantic effort, says Frank Wiener, vice president and general manager of Paradyne's DSL division. The final G.Lite standard won't be approved until after the show.

Whatever interoperability is demonstrated may be rudimentary and slower than top speed. "Throughput will be the question," Wiener says.

Part of the compatibility problem is that with the standard still developing, vendors building products now are trying to hit moving targets, including DSL chip makers. If the chips don't work with each other, neither will the modems built around them, as modem maker 3Com has already discovered.

3Com builds DSL customer modems using chips from Alcatel, Analog Devices and Texas Instruments. As those vendors tinker with the software that runs the chips, 3Com doesn't have the staff to keep revising the modem software that rides on top, says Al Brisard, 3Com's director of marketing and business development. Chip makers need to stabilize their products, he says.

Alcatel and Analog Devices are working on the problem and plan for their chips to be interoperable by June, says Stephen Makgill, director of asymmetric DSL product management for Alcatel. At that point, modem makers will be able to focus on making the modems compatible, Brisard says.

While rushing the compatibility effort may drive modem makers a little crazy, service providers can't wait for them to succeed.

When they do, customers will be able to buy modems in retail stores. Service providers won't have to be in charge of modems at the customer end of the connections as they are today. Service providers will just turn on the service, adding a broadband datastream to the voice channel already on the line.

One carrier says it will hold off deploying a planned DSL service for six months, until the company is sure all the wrinkles are ironed out of G.Lite. "We're willing to wait until the first quarter of next year if it means the modems will be available in retail stores. We don't want to have to troubleshoot why the modem doesn't work with the [carrier DSL modem]," says Rich Poland, a network engineer for Blair Telephone Company in Blair, Neb.

G.Lite has been on a fast track since January 1998, when a group, including Microsoft, Intel, Compaq and the regional Bell operating companies, decided it wanted G.Lite standardized as soon as possible.

That group, which is known as the Universal ADSL Working Group (UAWG), is organizing the interoperability showcase and exerting pressure on modem makers. The group wants a demonstration of widespread G.Lite interoperability.

Features that go beyond passing data may not be ready for the showcase, according to Ken Krechmer, technical editor of *Communications Standards Review* in Palo Alto, and a member of the ITU G.Lite standard committee.

Those features include a sophisticated handshake between modems, Management Information Bases and a quick way to re-establish disrupted DSL links. The management feature and perhaps other work may be pushed off the plate for the June demonstration, Krechmer says. ◪

DSL fast track?

The standard for digital subscriber line technology has sped to approval, pushed by the UAWG, which sought approval of G.Lite, an easy-to-deploy version of DSL.

- **April 1997**
  International Telecommunication Union first takes up DSL
- **January 1998**
  Formation of the UAWG to spur development of G.Lite
- **February 1998**
  ITU settles on a single DSL line code called DMT
- **October 1998**
  ITU approves a preliminary G.Lite standard
- **May 1999**
  Interoperability plug fests planned
- **June 1999**
  Interoperability showcase scheduled for SuperCom
- **June 1999**
  Final G.Lite approval expected

Backspin

A site by any other name

MARK GIBBS

've got it!

You're probably asking yourself, could "it" be a blinding flash of spiritual revelation or a deep insight into the nature of the universe? Sorry, that was last week.

This week, my eureka moment was provided courtesy of Network Solutions, Inc. (NSI), the 'Net's original registrar of domain names and erstwhile joke factory.

The Internet Network Information Center (InterNIC) was built by NSI through grants funded by the government. Today, NSI has conveniently forgotten that it is doing this in the public trust and that the public is footing the bill.

This memory lapse is obvious when you go to the registration services at http://rs.internic.net, where you will find yourself redirected to http://www.nsi.com. When you get there you'll find a new, flashier NSI. But it's the same old three-ring circus.

I could spend the rest of this column dissecting NSI's sorry carcass, but instead I'm going to talk about how we could live happily without it or any other name registration service.

Let us begin by considering names used on the 'Net. They are often pretty artificial, and it has gotten to the point at which "good" domain names — those that have useful connotations — are impossible to find.

I figure that (1) everything else on the Internet is distributed, so why should we rely on a centralized naming service?; (2) running a centralized naming service is a political minefield; and (3) given the size of the 'Net, even good domain names don't make it easy to find or prevent another site from being mistaken for yours.

By way of example, my domain, gibbs.com, receives messages that the senders think will arrive at Gibbs & Associates (which is actually gibbsnc.com). I would bet that some proportion of my Web traffic is from users who make that same mistake before they run to AltaVista or Yahoo to find the correct domain name.

And there's the additional problem of a company not owning all related names. By related I mean alternate spellings such as acme-widgets.com for acmewidgets.com, or names that are similar to a known brand but are owned by another company: for example, a company called Lending Tree that owns the domain generalmotors.com.

So my idea is painfully simple. Forget domain names altogether.

Will your site be harder to find? No. People will find your site because you're listed in a search engine or pointed to by another site or search engine, or the address is on your business card. I'll bet that today most of us are found by one of these methods anyway.

So under the Gibbs scheme, we would all go by our IP addresses. And did you know that you don't have to express IP addresses in dotted quad notation (xxx.xxx.xxx.xxx)?

You can turn each byte of the dotted quad notation into binary, remove the dots, and translate that value into Base 10. Browsers will understand the Base 10 conversion just as well as they understand dotted quad notation.

So my Web site is accessible not only as www.gibbs.com and http://216.101.69.2/ but also as http://3630515458/. Cool, huh? Is that address hard to remember? Yep. But consider our general motors.com example. If you didn't guess that General Motors is gm.com, you'd just go to any of the directories to find them.

The key to all this would be for Web sites to put their names and details in XML on their home pages. That way, being correctly indexed by search engines would be easy, and more complex and useful information, such as the site's content keywords, content rating and other important attributes, could be discovered.

So can we abandon the Domain Name System? I think so, and I think it would make our lives infinitely simpler. Plus, we could just forget NSI completely. Eureka!

Bright ideas to nwcolumn@gibbs.com or (800) 622-1108, Ext. 7504.

'NET BUZZ

PAUL MCNAMARA

The buzz — and static — from last week's Spring Internet World '99:

On Tuesday, I had lunch with Alexandre Konanykhine, president of KMGI.com, a New York-based start-up. Before taking our food order, the waitress asked us to watch a short videotaped commercial on a TV screen positioned over our table. The same thing happened just before dessert.

Yes, I'm kidding. Nobody would put up with such an intrusion during lunch, unless, of course, the commercials showed scantily clad women romping on a beach.

However, KMGI's business is based on the dubious assumption that Web site visitors will sit still for five- to seven-second, full-screen "Webmercials" as a price for accessing the content they crave. KMGI has used Flash technology from Macromedia to produce prototypes of what Konanykhine insists will revolutionize Internet advertising. You can check them out at www.kmgi.com

"I believe advertisers are going to pay much more for something that works than they do for banner ads that don't work," he says.

But will the surfing masses watch commercials? Probably, given that they have learned to tolerate ads virtually everywhere else.

Me? I'm pointing my browser at the restaurant that will serve my meal without a heavy sales pitch for an appetizer.

One start-up that debuted here might drive network managers batty, or, prompt them to straighten out their drives. SportsID.com offers free online access to 500 Quicktime video clips that feature instructional advice from professional athletes in 50 sports. Advertising banners pay the freight.

Given the bandwidth demands for clips that run anywhere from two to 20 minutes, CEO Mark Passalacqua says he expects many of his customers will hit the site from their well-equipped workplaces. In other words, SportsID.com will be another "un-productivity tool," as my colleague Jim Duffy likes to call them.

"Hey, the bosses will be watching these things, too," Passalacqua predicts.

One clip promises to help me hit a golf ball off a downhill lie. If SportID.com can teach this duffer that trick, we may have a winner here

Have you ever been to a wedding where the reception hall was too small to accommodate all the guests? Those shunted to the auxiliary room are generally not amused, even if there's an open bar.

Which brings us to David Coursey's Showcase Encore '99, held last week in conjunction with Internet World. The event is a marriage of 3 interesting Internet companies and a select list — hey, Buzz was the — of press types and analysts. The Marriott's "grande salon" was packed with movers, shakers, yummy eats and free booze.

Stuck outside in a hallway, though, were a few spillover vendor tables, including two for some company called Microsoft.

Don't tell Gates.

Web-based fax companies were spread out across the show floor like so many chickens on Old McDonald's farm: Fax4Free, eFax, jFax, everywhere a fax-fax. With this much activity, one can assume there is a market here and that these folks will peck each other to death in pursuit of their rightful share.

Personally, I don't understand the appeal. Force me to deep-six one of our office communications devices, and it wouldn't take but a second to choose the fax machine. Sure, once a month or so a well-timed fax keeps my feathers out of the fry-o-lator, but 99% of the faxes our newsroom receives are little more than spam on white.

If the useless-to-useful ratio for e-mail were as high, there wouldn't *be* any e-mail.

When he's in a suit, McNamara is loath to give out his fax number. You may, however, contact him at (508) 820-7471 or pmcnamara@nww.com.

GO HERE.

www.mariposatech.com

TO HEAR.

ComNews :) Product Choice

EDITOR'S CHOICE

Access Made Easy™

Direct fly and hear why our ATM access solution has left the competition speechless. And why not? We've integrated high-quality compressed voice with video and data for unparalleled network efficiency and bandwidth availability. Of course, we've also made it easy to configure and manage. But hey, don't take our word for it. Check out our demos and find out for yourself. They're at **www.mariposatech.com**, or call us toll free at **1-877-4TO-HEAR** (1-877-486-4327).

Mariposa
Technology, Inc.

Data. Video. Voice. Vision

WAN CONNECTIVITY SOLUTIONS T3 T1 E1 FRAME RELAY xDSL HDSL HDSL2 ISDN DDS WIRELESS

you said you need a strong defense against unexpected downtime on your network.

ADTRAN delivers.

- Cost-effective dial backup solutions for packet and dedicated networks
- V.34 analog, Switched 56, and ISDN BRI and PRI options
- Dial backup around monitored Frame Relay networks
- Protection from physical line, LMI, and PVC failure
- Available for ADTRAN integrated access systems, Frame Relay performance monitoring and access devices, T1 multiplexers, and 56k to T1 DSU/CSUs
- Simple, field-installable cards

Cost-effective dial backup solutions for Frame Relay and dedicated wide area networks.

When the circuit goes down, and anxiety starts rising, you'll remain calm. Because with ADTRAN termination equipment in your network, your connectivity solution includes comprehensive disaster recovery capabilities. More proactive than router-based recovery plans and more cost-effective than carrier-based methods, ADTRAN's dial backup solutions give you exactly what you need to prevent expensive downtime and keep your network operational. Whether your network is packet or dedicated, you're protected—even on monitored Frame Relay circuits. Modular, field-installable dial backup cards instantly bypass an inoperative circuit— with no technician, no lost time. Don't go another day without it

Proactive disaster recovery solutions from ADTRAN

Visit www.adtran.com/recovery for a free white paper on disaster recovery. Or, call **877 399-7541** (toll-free) and request a free copy of ADTRAN's disaster recovery brochure.

N+I
Booth 3023

Experts choose ADTRAN.

ADTRAN